PREVALENCE OF POST-PARTUM DEPRESSION AMONG MOTHERS ATTENDING NAKURU LEVEL 5 HOSPITAL IN NAKURU COUNTY, KENYA

BY

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DECLARATION

 "This thesis is my original work and has not been presented for a degree in any other university."

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DEDICATION

I would like to dedicate my work to God, my husband and family for their continued
love and support during my studies.

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ABBREVIATIONS AND ACRONYMS

AHRQ Agency for Healthcare Research and Quality

ANC Ante-natal Care

EPDS Edinburgh Postnatal Depression Scale

ICD International Classification of Disease

NL5H Nakuru Level 5 Hospital

PPD Postpartum Depression

SPSS Statistical Package for Social Science

WHO World Health Organization

DEFINITION OF TERMS

Cognitive Development – It refers to the ability of processing information, conceptualizing resources, language learning, perceptual skill and other areas of brain development.

Edinburgh Postnatal Depression Scale– It is a "standardized self-reported" questionnaire that is used for screening women with postpartum depression, (see appendix 1)

Emotional Development – It refers to the growth in the progressive ability to differentiate between and express the appropriate emotions.

Pre-partum Onset – It refers to the period in which symptoms of depression may manifests before the child is born.

Postpartum Depression - Is also called postnatal depression, it refers to a type of clinical depression that affects women from 4 weeks to one year and after childbirth. Women suffering from postpartum depression feel sad, hopeless, empty, or even anxious.

Postpartum Psychosis – This is the severe case of postpartum depression. It characterized by psychotic symptoms such as hallucinations, delusions, thought disturbances and disorganized behavior or speech.

ABSTRACT

Postpartum depression (PPD) is a non–psychotic mood disorder that can affect women during perinatal period to one year after childbirth. Regardless of the outcome, women who experience postpartum depression, experience feelings of sadness, hopelessness and worthlessness, consequently, impacting negatively not only to the mother, but also to the family and the child's development. Many women suffer silently from PPD due to the little emphasis placed on the emotional and psychological care with a global statistics of 10-20%; the prevalence is estimated to be higher in Africa at 10-32% with 11 and 13% reported in Kenya. The aim of this study is to determine the prevalence of PPD among mothers attending Nakuru Level Five hospital in Nakuru County. This research was a cross sectional descriptive study design, which was carried out among mothers from six to eight weeks postpartum seeking maternal child health care clinic services as outpatient. Simple random sampling was used to identify 381 study participants. Data was collected using a researcher-administered structured questionnaire comprising of the Edinburgh Postnatal Depression Screening tool, this collected information regarding socio-demographics, obstetric and child factors. The key informant guide with questions that helped to identify barriers associated with PPD. Analysis was done using statistical software – SPSS version 20 to provide descriptive and inferential statistics by use of t-test for normal distributed data, chi-square for categorical variables and also regression and correlation for comparisons. Results: Majority of the study participants were aged 20-29 years majority 78.7% of them were married, 40.7% reported to have achieved secondary education level while 3.7% had none.67.5% reported a household income of less than Ksh. 19,000 whereas 5% reported of a household income of above 60,000. 17.6% reported to have experienced intimate partner violence, 37.6% reported to have been stressed during the peripartum period, 81.1% reported to get spousal support, and 67.5% said the pregnancy was planned. The PPD prevalence of 11.3% was obtained from this study. On their knowledge level, only 32% were aware and only 2% had ever been screened of PPD. On bivariate analysis, there was a significant relationship between Postpartum depression and gender based violence (p=0.00), peripartum stress (p=0.00), spousal support (p=0.00) and planned pregnancy (p=0.001). This study identified the following barriers to early diagnosis and treatment of PPD: Lack of screening tool in the study area, lack of holistic approach in examination of the mother as more emphasis was placed on the physical wellbeing of the mother other than the psychological and lack of health education on PPD among health care workers. In conclusion, this study identified the prevalence of PPD in Nakuru County at 11.3%, and noted significant association between gender based violence, stress, lack of spousal support, unplanned pregnancy and PPD. PPD is common in our setting however, diagnosis is often missed thus, this study recommends the following that may help improve early detection. For mothers, psychosocial support during the perinatal period that should target victims of Gender Based Violence and offer family support. The health care workers should be sensitized through Continuous Medical Education (CME), provision of policies and screening tools in the health care facility and there should be Community sensitization through mass media on stigma and recognition of early signs of PPD.

CHAPTER ONE: INTRODUCTION

1.1 Background to the study

Postpartum depression is a non-psychotic mood disorder that occurs after childbirth, it affects one in seven women (Caffrey, 2018). The WHO has classified postpartum depression in ICD-10 under the category of mental and behavioral disorders associated with puerperium as depression with postpartum onset that occurs within 6 weeks of delivery (Epocrates 2016). Women who experience PPD have intense depression with the following symptoms: feelings of anger, cry more than usual, withdraw from their family, distressed and detached from baby, worry that they may injure their baby and feel guilty about not being a good mother (CDC, 2016).

The prevalence of PPD is estimated to be at 10 - 20% globally, (WHO, 2016). However, the prevalence rate in developing countries is estimated to be higher than that of developed countries, due to, higher prevalence reported in developing countries than developed countries. Prevalence of 0% has been reported in Singapore whereas 57% has been reported in Brazil, (Lanes, *et al.* 2011). Current literature suggest that the perinatal mental disorders which includes postpartum depression, is high in low and middle income countries and is estimated to range at 18.6%, this prevalence was reported after a systematic review of 47 studies in 18 countries, (Upadhyay, 2017). In Africa, the prevalence is estimated to between 10% to 28% (Madeghe *et al.*, 2016), however this varies depending on the regions, whereas in Kenya prevalence of 10.6% (Mwikali, 2013) and 13.5% (Madeghe *et al.*, 2016) has been reported.

Expectant mothers form part of a cohort referred as the vulnerable groups in health care sector. This is because they are at risk of several health problems that may lead to the loss of baby, mother or both thus, they need the utmost care (Shivayogi, 2013). In this regard, the Government of Kenya has put too much attention and resources on the physical well-being of expectant mothers by rolling out several standardized health care projects aimed at the well-being of this group. However, very little effort has been put to handle the mental/psychological well-being of the mother during peri-partum care thus, this study sought to determine the prevalence of post-partum depression among mothers seeking health care at Nakuru County Level Five Hospital through screening. The study findings also sought to evaluate the factors correlated with occurrence of PPD, as well as highlight treatment, diagnosis of PPD practice in Nakuru County, thus, this will therefore enable the policy makers, and health care workers plan for the care of the affected mothers, and determine barriers to early diagnosis and treatment of the disease.

1.2 Statement of the problem

On several occasions, most health workers have diagnosed cases of Postpartum psychosis which presents as a complication of PPD, a practice too little too late. The lack of early diagnosis and treatment has not only subjected the mother to psychological trauma, but also the newborn to the negative impacts of PPD, therefore, leading to several potential harmful effects not only on the maternal-child attachment but also on the infant's development, (Fitelson *et al.,* 2011).

The Government ministry of Health, with the help of supporting partners have aimed at reducing maternal mortality rate by focusing on maternal health care. This has led to the standardization of health care practices in all the health care facilities, however, little emphasis has been placed on the emotional and the psychological aspect of the mother, whereby, many cases of PPD go undetected and if they are detected they remain untreated, therefore, the health needs as defined by the WHO are not met. WHO (1948), defines health as a state of complete physical, mental and social well-being and not merely absence of disease or infirmity. The District Health Information Software, (DHIS), data indicates that less than 1% of new patients are diagnosed with depression, this is below the target set of 3% (KHSSP 2016). This data is due to little information available on mental health cases in Kenya, attributed to lack of proper diagnosis in outpatient clinics, (KDHS 2014). Hence, this study sought to assess the prevalence, factors, diagnosis, and treatment of PPD among mothers attending clinic services at NL5H, which neither has data of PPD in their health records nor published data on the prevalence of PPD.

1.3 Justification of the study

PPD burden in our setting is unknown. Despite dire effects of PPD on both the health of the mother and child, minimal interventions occur in most health facilities. This research sought to generate knowledge on the prevalence, diagnosis and treatment of PPD. This knowledge will help increase awareness, provide data for future reference, and indicate the disease burden in Nakuru County, which has no published data on PPD. The knowledge generated from this research will help in planning for early intervention by policy makers' hence overt prolonged morbidity and improve child survival.

1.4 Research questions

1. What is the prevalence of postpartum depression among postpartum mothers' attending maternal-child health clinic services at Nakuru Level 5 Hospital?

2. What factors are as associated with the occurrence of PPD among postpartum mothers' attending maternal-child health clinic services at Nakuru level 5 Hospital?

3. What is the diagnosis and treatment of PPD in Nakuru Level 5 hospital among mothers' attending maternal-child health clinic services?

1.5 Research hypothesis

Null Hypothesis

1. There is no relationship between maternal socio-demographic factors and PPD.

2. There is no relationship between maternal stress, social support system, planned pregnancy, mode of delivery, child health status and PPD.

1.6 Objectives of the study

1.6.1 Broad objective

To describe the prevalence of postpartum depression among postpartum mothers attending clinic services at Nakuru Level 5 Hospital.

1.6.2 Specific objectives

1. To determine the prevalence of post-partum depression among postpartum mothers' attending maternal-child health clinic services at Nakuru level five hospital.

2. To assess factors associated with postpartum depression among postpartum mothers' attending maternal-child health clinic services at Nakuru level five hospital.

3. To identify diagnosis and treatment of postpartum depression in Nakuru Level 5 hospital among postpartum mothers attending maternal-child health clinic services.

1.7 Significance and anticipated output

The study findings will help increase awareness of PPD among the health workers by providing relevant information that will aid them to identify promptly mothers suffering from PPD; this will help to improve the mental health care accorded to the general society. The study findings will be shared among policy makers to improve the policy and provide early interactions with the postnatal mothers. The study findings will also be shared with the general population to increase awareness of PPD among the public and will enable the student to acquire master's degree in Public Health.

1.8 Delimitation and Limitation

1.8.1 Delimitation

This study was conducted among mothers' attending clinic in NL5H and the nurses who were working in the perinatal clinic at the time of the study without regard to geographical location and population distribution.

1.8.2 Limitations

This study relied on the researcher administered Edinburgh postnatal screening tool other than the clinical diagnosis, which only assessed the symptoms rather than a complete clinical interview which could have establish a more reliable diagnosis of PPD. The researcher did not measure the stress level of the mothers during the research, underreporting or over-reporting may have occurred due to cultural and economic factors and social desirability. Sampling bias of hospital-based sample may have

excluded women who do not attend postnatal clinics and early onset of PPD before six weeks that improved by the time of the interview may have been missed.

1.9 Theoretical framework

There are several theories that researchers have developed to form a base of postpartum depression. There are three theories that have been associated with PPD: medical theory, hormone theory and psychological theory, (Abdollahi, *et al.,* 2016)

1.9.1 Medical theory

This views PPD as a medical condition that results due to a pathologic mood disorder where women acquire the disease due to their biological factors and suffer depression episodes around a particular time in their life, (Abdollahi, *et al.,* 2016). This medical condition creates significant impairment in functioning and thus requires professional treatment, (Yim *et al.,* 2015)

1.9.2 Hormone theory

There are different theories that exist regarding hormonal effects on PPD. These theories include withdrawal theory, change in the levels of gonadal hormones and interaction between the hypothalamic-pituitary-adrenal system and hypothalamic-pituitary-gonodal system, (Abdollahi, *et al.,* 2016).

Research has demonstrated that reproductive hormones plays a crucial role in controlling depression. Hormones such as oestrogen, progesterone, beta-endorphin, human chorionic gonadotrophin increases during pregnancy and falls significantly after delivery, quick shifts of these hormones have been associated with PPD. Sudden withdrawal of these hormones affects greatly women with a history of PPD, (Abdollahi,

et al., 2016). Women with a history of PPD are vulnerable to subsequent attacks of PPD because they have a differential sensitivity to changing levels of hormones as compared to women with no history of PPD, (Yim *et al.,* 2015)

1.9.3 Psychosocial theory

Psychosocial stressors significantly change the neurotransmitter balance thus triggers the neurophysiological and neurochemical changes in the brain. Psychosocial stressors majorly triggered by:

1.9.3.1 Psychodynamic theory

Psychological problems that occurs after childbirth may arise due to unfinished business in the women's childhood or family. A woman who fails to accept mother's role or have trouble in adapting to their new role of motherhood and family negative attitude interferes with the mothers coping mechanisms, (Abdollahi, *et al.,* 2016).

1.9.3.2 Cognitive psychology theory

This theory indicates that certain characteristics of personality predisposes the mother to PPD, (Abdollahi, *et al.,* 2016). Anxiety that results in compulsive tendencies such as controlling and perfectionist and later the woman may feel loss of control thus leading to lack of capability to cope with infants' demand and care; this thought disturbances might lead to depressed moods, (Nemade *et al.,* 2011).

1.9.3.3 Social and interpersonal theory

Environment and interpersonal struggles have significant influences on mental health, (Abdollahi, *et al.,* 2016). The following interpersonal factors makes a woman vulnerable

to PPD, they include; lack of affection and disappointments in relationships, insufficient social support, childbirth and transitional events in life to motherhood leads to anxiety and may trigger depression, (Grupe & Nitschke, 2013).

1.9.3.4 Behavioural theory

This theory postulates that depressive episode occurs because of a major life events that disrupts an individual's normal support pattern. Life stressors such as parent's divorce, mother-daughter conflict, low parental emotional support and self-esteem are predictors of PPD, (Abdollahi, *et al.,* 2016).

1.10 Conceptual framework

Independent Variables	Intervening Variables	Dependent Variable

1. Socio-demographics
Age, marital status, religion, occupation, ethnicity, level of education

2. Maternal Factors
Knowledge, attitude and practices, Social Support, Cultural /Myths, Health Status, Parity and obstetrics history, Maternal stress

3. Child Factors
Age, Sex, Demands of the newborn, Health status of the newborn

Health system factors
Health care policies.
Health care workers
Knowledge, Attitude and Practice

Post-partum Depression

Figure 1.1 Conceptual framework

Adopted and Modified from Biratu A., & Haile D. (2015)

1.10.1 Independent variables

These variables make a mother vulnerable and may predispose them to PPD includes:

I. Sociodemographic variables

    a. Age where PPD has been associated with maternal age.

    b. Marital status – plays a crucial role due to source of support and mothers' responsibilities.

    c. Religion – the values and beliefs of the mother is moulded by their religion.

    d. Ethnicity – culture plays a role in support and care of mother by other family members, it also shapes their behaviour on how they behave when seeking help.

    e. Occupation – research has shown relationships between occupation and PPD.

II. Maternal factors these includes the components in the mother that may predispose her and may make her vulnerable to PPD they include:

    a. Knowledge, Attitude and Practice – mothers' awareness on PPD and whether they are able to identify they have PPD and seek help by always screening and getting further care.

    b. Cultural /Myths – what mothers attribute the illness to determine the care they will seek help from either their elders, religious leaders or doctor.

    c. Health status – this increases vulnerability due to stress

    d. Parity/ Obstetric history – elderly mothers and those with bad obstetric history may suffer from anxiety, have controlling nature and may become perfectionist that may trigger PPD as supported by cognitive psychology theory, (Abdollahi, *et al.,* 2016).

    e. Maternal stress/major life events – this may trigger stress on the mother and the mother may lack the ideal coping mechanism thus they become vulnerable to PPD.

III.   Child factors – factors on the baby that may trigger PPD on the mother, they include:

    a. Age and demands of the new-born – the younger the child the more dependency they have and this increases their demands and may trigger stress to the mother

    b. Sex of the new-born – due to cultural beliefs the mother, husband and family who may not be satisfied with the child's gender.

    c. Health status of the new-born – this may increase vulnerability of the mother to PPD, due to demands and cost of seeking health care.

1.10.2 Intervening variable

This variable aids in identifying mothers' suffering from PPD, it includes:

I.   Health system factors

a. Health care policies – these policies will help identify mothers with PPD, such as having a screening tool in the facility, linking of the Child Welfare Services with Psychiatry department.

b. Health care workers knowledge, attitude and practice – the health care workers who provide clinic services to the mothers should be trained on PPD in diagnosis treatment and referral of PPD cases.

1.10.3 Dependent Variable

Postpartum depression – prevalence of the mothers suffering from PPD

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Mental wellbeing is defined as a state where an individual realizes his or her own abilities, can cope with their normal stresses of life, can work productively and fruitfully and is able to contribute to his or her own community, (Rotich & Tugumisirize 2017). PPD is a mental health illness which is chronic, debilitating psychological condition that affects women during postpartum period to one year after childbirth. Reduced quality of life, costly treatment and management with increased risk of numerous life threatening events and complications characterize it, (Dennis & Dowswell, 2013). The World Health Organization has identified major depression as the leading cause of years lived with disability and has ranked it as the fourth leading cause of burden of disease, currently identified as an international public health concern, (WHO, 2012).

2.2 Socio-demographic characteristics

The patients' socio-demographic characteristics plays a role as a predictor of postnatal depression, most research indicates that level of education, employment status and mother's age as a high risk of being associated with postnatal depression (Lewis *et al.,* 2017). However, other research findings has given contradicting information on the level of education as a risk factor for PPD, (Salinheh *et al.,* 2014) where other researchers have associated PPD with both higher and lower levels of education, (Haque, *et al.,* 2015). Research also indicates that factors such as poor social support, marital conflicts and violence, low levels of partner support, personality disorders, and low income level as predictors of PPD, (Turkcapar *et al.,* 2015). These findings contradicts the findings of research done by Chinawa *et al.,* (2016) on the Prevalence of PPD, where they found no

associations between social class, parity, maternal age and gender of the baby with postpartum depression. It also indicates that women who were exposed to violence in the course of their perinatal period, women with a history of premenstrual syndrome, psychiatric history and unplanned pregnancies have an increased risk for developing PPD than others; other significant findings made were unplanned pregnancy and dissatisfaction with the pregnancy also contributed to the risks associated with PPD.

Research done by Saligheh *et al.,* (2014) indicated that mothers' and infants age and maturity is a predictor of PPD; the older the mother the lower the risk of PPD, this is associated with increased heights of maturity and life experiences that assists the mother to cope with emotions associated with motherhood. Whereas, the younger the baby's age the higher the level of PPD mainly attributed to the burden of parenting responsibility, however, this contradicts a research done by (Muraca & Joseph, 2014) which associated PPD with maternal old age.

Religion, number of children and marriage at an older age were identified as risk factors to PPD, (Hamdan & Tamin, 2011), in addition women who were from low socioeconomic status were found to be at greater risk of developing PPD, (Bener *et al*., 2012). Work related problems were also found to be associated with PPD, which is associated with the stress at work and limited contact with the family, (Haque *et al.,* 2015).

2.3 Prevalence of postpartum depression

PPD is rated as one of the most increasing epidemics globally with current statistics at $10 - 20$ and it is estimated to affect a minimum of 1 among 8 mothers in a year (WHO, 2016). The World Health Organization indicates that globally 10% of pregnant women

experience PPD while 13% experience PPD after child birth, (Fisher *et al.,* 2012), however, figures are greater in developing countries where 15.6% of women suffer from PPD during the antenatal period while 19.8% experience PPD after childbirth, (Rahman *et al.,* 2013). In Africa, prevalence rate ranges between 10% to 28% (Madeghe *et al.*, 2016), however higher prevalence as high as 60% has been reported in other regions (Fitelson *et al.*, 2011). In East Africa, prevalence of PPD is reported to be at 20% among antepartum period and 6-39% during the postpartum period, (Ongeri *et al.,* 2018).

The variation of prevalence in Africa has been reported as follows: In Nigeria, prevalence of 22% (Tungchama *et al.,* 2018), Cameroon prevalence of 23.4% (Adama *et al.* 2015), South Africa prevalence of 27% (Khalifa *et al.*, 2016) and 50% was reported (Stellenberg & Abrahams, 2016). Sudan reported a lower prevalence of 9.2% (Khalifa *et al.,* 2016) and Tanzania reported a prevalence of 12% (Peltzer *et al.*, 2018). In Kenya prevalence of 10.6 (Mwikali, 2013) and 13.5% (Madeghe *et al.*, 2016) has been reported. Variations in the prevalence of Post-natal depression from different countries has been well documented in literature as presented in table 2.1.

Table 2.1: Prevalence of postpartum depression in different countries

Country	Reference	Prevalence
United states	(Ko *et al.*, 2017)	11.5%
India	(Modi *et al.*, 2018)	20%
South Africa	(Redinger *et al.*, 2018)	27%
Nigeria	(Tungchama *et al.*, 2018)	22%
Sudan	(Khalifa *et al.*, 2016)	9.2%
Tanzania	(Peltzer *et al.*, 2018)	12%

The variability of the prevalence rate in Africa region has been attributed to: cultural variables – where many people view mental health as a misfortune or a form of punishment from God, thus, they rely on the traditional healers who interpret mental illness as possession or a curse, (Behere *et al.,* 2013). In addition, different socioeconomic status and the determinants of health care, (Stuart-Parrigon *et al.*, 2014), cross different reporting styles, difference in perception of mental health and its stigma, biological vulnerability factors and different in social economic environments i.e. poverty, levels of social support nutrition and stress, (Rahman *et al.,* 2013). Other factors that may lead to variation of prevalence include scarcity of available mental health resources and the distribution and inefficiencies in utilization (Upadhyay, 2017), cross cultural variables and socioeconomic variables, screening methods, difference in perception of mental health and its stigma, (Lanes*, et al*., 2011) and difference in methodology and different timing during screening, (Mwikali, 2013).

The National Institute of Mental Health has indicated that the disease burden is greater in mothers who had already experienced PPD in their previous pregnancy with a likelihood of 20% to 25%, (Field, 2010).

2.4 Factors associated with postpartum depression

The exact cause of PPD is not well understood. However, many researchers have attributed the cause of the condition to the drop of hormones (estrogen and progesterone) levels, immediately after birth leading to chemical changes in the brain, (Miyake *et al*., 2011) and the lack of enough rest required to fully recover from giving birth due to the newborn's demands (Iranpour, *et al.,* 2016).

Agency for Health Care Research and Quality, 2012, identified consistent risk factors associated with PPD. These factors include history of depression prior to conceiving, depression or anxiety during the antenatal period, having experienced traumatic life experience during antenatal or early postpartum period, decreased levels of social support by the immediate family members, mothers' age, low economic level, parity and low maternal education levels, moreover, this concurs with research done by Hansotte *et al.,* (2017). Mothers are more likely to develop PPD when there is inadequate support from the husband, family and friends especially in the care of the newborn due to his increasing demands (Field, 2010). Despite the lack of satisfaction and support by the partner which has been vastly documented as a risk factor of postpartum depression.

Poverty, intimate partner violence and HIV infection has been associated with PPD by many researchers, (Ongeri *et al.,* 2018). Moreover, other risk factor that can predispose a woman into PPD is stresses in life without good coping mechanisms in terms of financial support in raising the child, obstetric complication and poor health of the new-born, (Biaggi *et al.,* 2016). This research findings is consistent with research done in Cameroon that showed a relationship between financial problems and PPD, (Adama *et al.,* 2016) which is consistent with the research done in Saudi Arabia that indicates loss of employment as a risk factor of postpartum depression, (Amr *et al.,* 2012).

Other researchers have classified risk factors into three: strong predictors, moderate predictors and small predictors. Strong predictors' risk factors include decreased levels of support, traumatic life experience, anxiety or depression during the antenatal period and history of depression. Moderate predictors include: pressure associated with child care, mothers mental disturbance, and demanding infant character while small predictors

include obstetric and antenatal complications, low financial status, poor interpersonal spousal relationships, single/divorced/widowed marital status, (Yim *et al.,* 2015).

Gender based violence has been vastly documented as a major factor associated with PPD, this violence can either be physical or emotional or both (Fisher, 2011). Violence in women has a devastating consequence to women's physical, psychological, mental and reproductive health and sometimes disability or death which gets worse on a peri-partum woman who is considered to be in a vulnerable group and this violence may not only affect the mother but also the health of the baby, (Rahman *et al.,* 2013). A research done by Addishiwet & Yohannes, 2018, reported PPD as a common mental health problem among postnatal mothers and their study identified Gender based violence and dissatisfaction in marital relationship as major factors associated with PPD. A research done by Islam *et al.,* 2017 on Intimate Partner Relationships around the time of pregnancy and PPD in Bangladesh identified a significant relationship between PPD and women who reported exposure to physical, sexual or psychological intimate partner violence. Violence result to an emotional impact resulting in negative health behaviors such as substance abuse and mood disorders (Adama & Adiema, 2018).

Risk factors identified by a research done by Rahman *et al.,* (2013), on the Interventions for Common Prenatal Mental Disorders in Women in Low- and Middle-Income Countries, includes sufferers of gender-based violence, unplanned pregnancy, lack of autonomy, a mother with quarrelsome in-laws. Furthermore, it also states that being socially deprived sickness and infirmity during the antenatal period, lack of support from the spouse and family and the sex outcome of the infant predisposes a woman to PPD. The connection between the ethnic, interpersonal and socioeconomic factors majorly in

Africa increases the significant risk of PPD regionally, (Fitelson *et al.,* 2011). These factors include: prejudice against female child, gender role restriction on house chores and newborn care, unpaid workload particularly in multigenerational household where the daughter daughter-in-law lacks autonomy, lack of education, victims of gender based violence who have been abused both emotionally and physically and mothers who lack of support by their partners, (Fisher, 2011). However, a research done by Chinawa *et al.,* 2016, noted no associations between maternal age, social class, parity and gender of the baby, older first-time mothers, mode of delivery and postpartum depression. Studies done in Kenya indicates that there is a strong association between economic stress, partner conflicts and postpartum depression, (Ongeri *et al.,* 2018), thus there is need to raise awareness through public health sensitization and mass screening during the clinic visits (Hansotte *et al.,* 2017).

2.5 Diagnosis and treatment of postpartum depression

Early detection and intervention are not only beneficial to the mother but also on the infant's growth and development. Thus, it plays a crucial role in mitigating the risks associated with PPD. Harmful effects of PPD on the growth and development of children is detrimental in developing countries due to the impact of low economic status and malnutrition, (Rahman *et al.*, 2013). It therefore leads to low birth weight, infants under-nutrition and stunted growth during the first year of life, (Fisher, *et al.,* 2013). The increased cases of diarrheal diseases, incomplete immunization schedule and poor cognitive development in young children have been attributed to PPD, (Rahman, *et al*., 2013). The effects of PPD during prenatal period leads to poor intrauterine growth and

risk of pre-term births, hence these has augmented cases of low-birth weight among mothers suffering from PPD, (Shidhaye & Giri, 2014).

The treatment options for postpartum depression includes pharmacologic and non-pharmacologic treatment, (Fitelson *et al.,* 2011). The pharmacologic mode of treatment is intricate due to the risks associated with breastfeeding, (Pope & Mazmanian2016). The non-pharmacologic treatment of choice for PPD is psychological treatment because they are effective and have no risks involved, it includes interpersonal therapy, behavioral therapy, and other supportive ways such as counseling, peer and partner support, (Denis *et al.,* 2012).

Several diagnostic tools have been developed to diagnose post-partum depression. They include Edinburgh Postnatal Depression Scale (EPDS), (Cox *et al.,* 1987), the Nine-item Physician's Health Questionnaire (PHQ-9), (Maust & Thase, 2012), and the Postpartum Depression Screening Scale (PDSS), (Beck *et al.,* 2001). However, the most widely used epidemiologic screening tool is the Edinburgh Postnatal Depression Scale (EPDS) (see appendix 1) due to its extensive validation, simplicity with good validity and reliability (O'Connor *et al*, 2016). Moreover, this tool is highly recommended due to the inclusion of anxiety symptoms which is a prominent feature of perinatal mood disorder hence increases its specificity for perinatal depression (American College of Obstetricians and Gynecologists 2015). The latest scale validation of the EDPS tool was done by O'Connor *et al*, 2016 who reported that the tool has a high sensitivity of $67 - 100\%\%$ and specificity of 87-99%.

PPD is effectively managed if it is detected early through: psychological treatment or the use of pharmacological treatment, the two modes of treatment can be used individually

or together, (Dennis &Dowswell, 2013). When PPD is not diagnosed early, it may progress into severe or chronic state which not only affects the mother but also the infant and the family thereby increasing maternal and perinatal morbidity and mortality, (Mwikali, 2013).

PPD is a main health issue among many women in various nations, it often remains undetected despite the existence of universal access to health care, this thereby leads challenges in dealing with the problems and their complications, (Mburu, 2013). This occurs despite the availability of effective treatments and the measures created to detect depressive symptoms, (Philips, 2012). Statistics indicates that at least 50 % of PPD go unrecognized, (Statistics by Country for postpartum depression, 2014), research also indicates that mental disorders are not prioritized in developing countries this is due to other competing health care disorders, (Fisher *et al.,* 2012).

Various experts have recommended PPD screening during the first postpartum clinic, which is usually done within 2 − 6 weeks post-delivery at any health care interaction point, (Yawn *et al*., 2015). Studies have also indicated that screening PPD on an outpatient setting is feasible and can improve detection rates and treatment, the child welfare clinic services provides a convenient longitudinal chance to monitor for PPD, due to its regular occurrence (Yawn *et al*., 2015). Many cases of PPD remain undiagnosed; it is majorly hindered newborn demands that affects the mothers' appetite, sleep and intensified apprehension aimed at the newborn, (Fitelson *et al*., 2011). The District Health Information Software, (DHIS) in Kenya, data indicates that less than 1% of new patients are diagnosed with depression, this is below the target set of 3%

(KHSSP 2016). This data is due to little information available on mental health cases attributed to lack of proper diagnosis in outpatient clinics, (KDHS 2014).

Sobey, 2010 identified the lack of insurance cover for mental health, decreased access to health care, the lack of screening and follow-up as barriers to early diagnosis. To improve early detection and treatment of PPD, there should be strengthened systems and enhanced collaboration between primary care and mental health providers to provide appropriate treatment and follow-up, (Yawn *et al.,* 2015). Engagement through sensitization of both patients and health care workers will help in assisting the uptake of the screening programme by simple scoring and ease in interpretation. Moreover, willingness to offer follow-up and willingness of the women to accept further help when diagnosed after clinical review by a psychiatrist can aid in early detection and treatment of PPD. (Ayres *et al.,* 2019). In order to identify mothers suffering from PPD, routine postpartum screening can be done during the perinatal clinics using the most reliable screening tool that can be determined through research and the mothers identified to be at high risk can be closely monitored for development of PPD, (Yawn *et al.,* 2015).

There are different approaches that have been identified by researchers that may help to mitigate the barriers includes: improving the coordination of care by enhancing providers' knowledge and skills in screening diagnosis and treatment among the health care providers who frequently interact with women (Ko *et al.,* 2013). This type of approach can be effective if the primary care givers in contact with the patients have the interest in continuing medical education (CME). This is supported by a survey done by American Congress of Obstetrics and Gynaecology (ACOG), found out that only a third of primary care givers reported of having taken continuing medical education on mental health and were likely to diagnose patients using validated questionnaire and routinely

ask about the symptoms, tracking women and organising for follow-up care (Leddy *et al*., 2012). The lack of awareness and stigma stops women from seeking health care, system level barriers to treatment and diagnosing PPD has contributed to 50% of cases not diagnosed due to lack of proper screening and even when detected 25% of cases are treated, (Caffrey, 2018).

In Kenya, screening of PPD is a challenge due to lack of a screening tool in most health facility; moreover, screening programs are recommended only in circumstances where there is follow up interventions, (Ongeri *et al.,* 2018). However, research done in Kenya recommends regular screening in order to identify the affected mothers during the clinic visits in health care facilities, (Mburu, 2013).

CHAPTER THREE: MATERIALS AND METHODS

3.1 Introduction

This chapter describes the study area, research methods used to carry out the research, which also includes the study population and the sampling technique and ethical issues regarding this research.

3.2 Research design

The study design was a cross-sectional descriptive study design that sought to determine the burden and determinants of postpartum depression among mothers attending clinic services at NL5H. This research design was selected in order to provide a snapshot of the prevalence of PPD among mothers attending maternal child health clinic services in Nakuru Level 5 Hospital as the population is assessed at a single time.

3.3 Variables

3.3.1 Independent variables

1. Socio-demographic and economic factors – Age, Marital status, Religion,, level of education, Occupation, Ethnicity, Level of education

2. Maternal Factors -, social support, cultural/Myths, mother's health status, , Gender based violence, Parity/ Obstetric concerns Knowledge, attitude and practices

3. Child factors – age, sex of newborn, demands of the new born, health status of the new born

3.3.2 Intervening variable

Health system factors – Health care policies, health care workers Knowledge, Attitude and Practice

3.3.3 Dependent variable

Postpartum depression

3.4 Location of the study

The study was conducted in Nakuru level 5 Hospital in Nakuru County, Kenya. It is the fourth largest Government hospital in Kenya, located approximately 4.4km from Nakuru town; it serves as a referral hospital within the counties found in the South and Central Rift Valley region and from other regions, with a population of more than 3.6 million. This study area was chosen because it serves as a referral County hospital in Nakuru with an approximated 9600 number of deliveries per year and an approximate of 721 mothers who seek postnatal and child welfare clinic care monthly at six weeks postpartum, this makes the hospital representative of the County, (RVPGH, 2015).

3.5 Study population

The target population were all postpartum mothers seeking postnatal and Maternal Child Health (MCH) Clinic Services in NL5H. The entry point for the study participants was at six-eight weeks postpartum this is because the EDPS screening tool examines mothers' from six to eight weeks postpartum, moreover, the tool examines the mother's symptoms in the past seven days. The study population was drawn from the accessible population from the mothers seeking MCH clinic services in the hospital.

The inclusion criteria was:

- All mothers in the child bearing age.

- Mothers' who were within six - eight weeks postpartum.

- Mothers' who gave written consents

- Mothers' below eighteen years, consent was sought from their guardian,

Mothers excluded from the study included:

- Mothers with previous mental illness

- Ill mothers

- Mothers' with ill children

The 16 health care workers (nurses) working in the perinatal clinic were included in the study as Key informants.

3.6 Sampling technique

The study population was derived from the target population postpartum mothers seeking postnatal and child welfare clinic services in NL5H. A sampling frame was generated using the attendance record obtained from the registry. Simple random sampling was done by placing numbers in a container where mothers who met the inclusion criteria and picked any number from the container from one to fifteen daily for four weeks, were included in the study.

3.7 Sample size determination

Mugenda and Mugenda (2003), recommends that research done in the field of social science, Fisher et al formula (1991) can be applied where:

$$n = \frac{z^2 pq}{d^2}$$

Where: n= the desired sample size

Z=the standard normal deviate at the required confidence interval 95%

P=the proportion in the target population estimated to have the characteristics being measured (0.5)

q= 1-p

d= the level of statistical significance set (0.05)

Hence:

$$n = \frac{1.96 \times 1.96 \times 0.5 \times 0.5}{0.05 \times 0.05}$$

n=384

The estimated sample size was 384 mothers.

3.8 Research instruments

The data collection technique was a researcher administered semi-structured questionnaire with both closed ended and open-ended questions. The tool incorporated questions that sought to identify factors associated with PPD (including socio-demographic, cultural, economic, and maternal and child factors). The tool also had an EPDS, a screening tool for postpartum depression which sought to identify mothers who have postpartum depression. The screening tool consisted of 10 items where the

response categories were scored as 0, 1, 2 and 3, and this was dependent on the severity of symptoms. The total score was obtained by adding the scores on each item mothers who scored 13 or more on the EDPS were considered as positive on tests for PPD. The questionnaire was guided by the Edinburgh postnatal depression tool, the conceptual framework, the literature review and previously used instruments. Key Informant Guide was used to get information from the health care providers working in the postnatal clinic which comprised on questions on the awareness of PPD, familiarity and availability of the screening tool, experience in the diagnosis and records of diagnosis of PPD. All the 16 nurses working at the perinatal clinic were included in the study as Key informants.

3.9 Pretest

A pre-test was done on the data collection tool in a similar population in order to identify the overlooked constraints in the applicability of the tool. The pre-test was done at Mogotio Health Centre using 10% of the study population, 40 mothers, where the comments and suggestions concerning instructions, clarity of the tool and were taken into consideration to improve the tool before the actual study.

3.10 Validity

Validity of the instrument was sought through pre-testing the instrument tools prior to administration to the study participants. Views from other researchers and supervisors were incorporated in the development of the research tool.

3.11 Reliability

To ensure reliability, a pre-test was done to test the instruments, and the challenges identified from the study were incorporated to the instrument. Moreover, all research

assistants were trained on how to collect data prior to data collection, this helped to reduce errors and omissions during data collection. In addition, the research assistants who were trained and were more conversant with the tool and postpartum depression administered the questionnaires.

3.12 Data collection technique

Data was collected by the help of research assistants using a pretested research administered semi-structured questionnaire which had two sections. The first section included the sociodemographic characteristics, factors associated with PPD and barriers to early diagnosis whereas the second part included the EPDS screening tool. The study participants were obtained in the postnatal clinic through where the study participants were obtained through simple random sampling who met the inclusion criteria; the mother was at six – eight weeks post-delivery, had no mental illness and was able to give a written consent, were selected to participate in the study. The participants were informed about the research and on how confidentiality and anonymity will be maintained, they were also informed that participation was voluntary and they could withdraw at any time. The mothers who scored thirteen and above in the screening tool were considered to be suffering from PPD.

3.13 Data analysis and presentation

Raw data retrieved from the questionnaires was edited manually to check for uniformity, completeness, and accuracy thereafter the data was analysed using the Statistical Package for Social Sciences (SPSS). Test for associations was analysed by use of fisher exact test for normal distributed data and chi-square for categorical variables. The data

presentation was distributed in descriptive form tables and figures and inferential by use of chi-square and Fisher exact test.

3.14 Ethical considerations

Approval of the proposal was sought from Kenyatta University graduate school (appendix 8) thereafter; ethical clearance was sought from Kenyatta University Ethical Review Committee (K.U.E.R.C) attached in appendix 9**,** and the research permit was obtained from National Commission for Science, Technology and Innovation (NACOSTI) attached in appendix 10. Permission to conduct the study in NL5H was sought from Nakuru Level 5 hospital superintendent, attached in appendix 11. Participation by the study participants was voluntary for those who met the eligible criteria. The eligible mothers were be informed about the research, and were reassured of their anonymity and confidentiality through coding rather than the use of the participant's name. Furthermore, those who gave consent were provided with a written consent form to sign (appendix 5), whereas those under 18 years permission was sought from their guardian. All research assistants were required to adhere to the required code of conduct regarding the study.

CHAPTER FOUR: RESULTS

4.1 Introduction

The study sought determine the prevalence of Postpartum Depression (PPD) among postpartum mothers attending clinic services at Nakuru Level 5 Hospital. A total sample size of 381 mothers were evaluated after passing through relevant selection criteria.

This chapter has been divided into four main subsections. Each subsection presents the results of each specific objective:

4.2 Objective 1: Sociodemographic characteristics of study participants

Three hundred and eighty one subjects aged between 10 to 49 years were interviewed. The mean age of the respondents was 23.8 years whilst the median age was 24.0 years. Of the total subjects reviewed, 226 (59.3%) were aged between 20 to 29 years, whilst 300 (78.7%), were married, whereas 18.9% were single and 2.4% were divorced. Of the total respondents, majority of the Married cohorts (30.7%) had secondary level of education, 21.3% had tertiary education, whilst only 2.2% had no education *at all*.

Majority (67.5%) of the respondents had a monthly income ranging between Ksh 0-19,000 whilst only 5% live on a monthly income above Ksh 60,000. With reference to the tribe of the respondents, the kikuyu tribe formed the majority of the sample population (56.7%), this group had the highest registered cases of PPD (62.8%). Whilst none of the Kamba tribe had a single case of PPD (Table 4.1).

Table 4.1: Socio-demographic characteristics of study participants

Demographic variables	Frequency (n=381)	Percentage (%)
10-19	29	7.6

20-29	226	59.3
30-39	119	31.2
40-49	7	1.8
50-59	0	0.0
60-69	0	0.0
Marital Status	**Frequency (n=381)**	**Percentage (%)**
Single	72	18.9
Married	300	78.7
Divorced	9	2.4
Education status	**Frequency (n=381)**	**Percentage (%)**
None	14	3.7
Primary	110	28.9
Secondary	155	40.7
Tertiary	102	26.8
Tribe of the respondents	**Frequency (n=381)**	**Percentage (%)**
Luo	39	10.2
Kikuyu	216	56.7
Kalenjin	48	12.6
Luhya	29	7.6
Kamba	6	1.6
Agusii	32	8.4
Others	11	2.9
Religion of the respondents	**Frequency (n=381)**	**Percentage (%)**
Christian	373	97.9
Muslim	8	2.1
Income of the respondents (Ksh.)	**Frequency (n=381)**	**Percentage (%)**
0-19000	257	67.5
20000-39000	98	25.7
40000-59000	7	1.8
60000	19	5.0

Residence of the respondents	Frequency (n=381)	Percentage (%)
Urban	177	46.5
Rural	204	53.5
Support system for the mother	Frequency (n=381)	Percentage (%)
Nuclear	300	78.7
Extended	73	19.2
Other	8	2.1

4.3 Objective 2: Prevalence of postpartum depression in Nakuru level five hospital
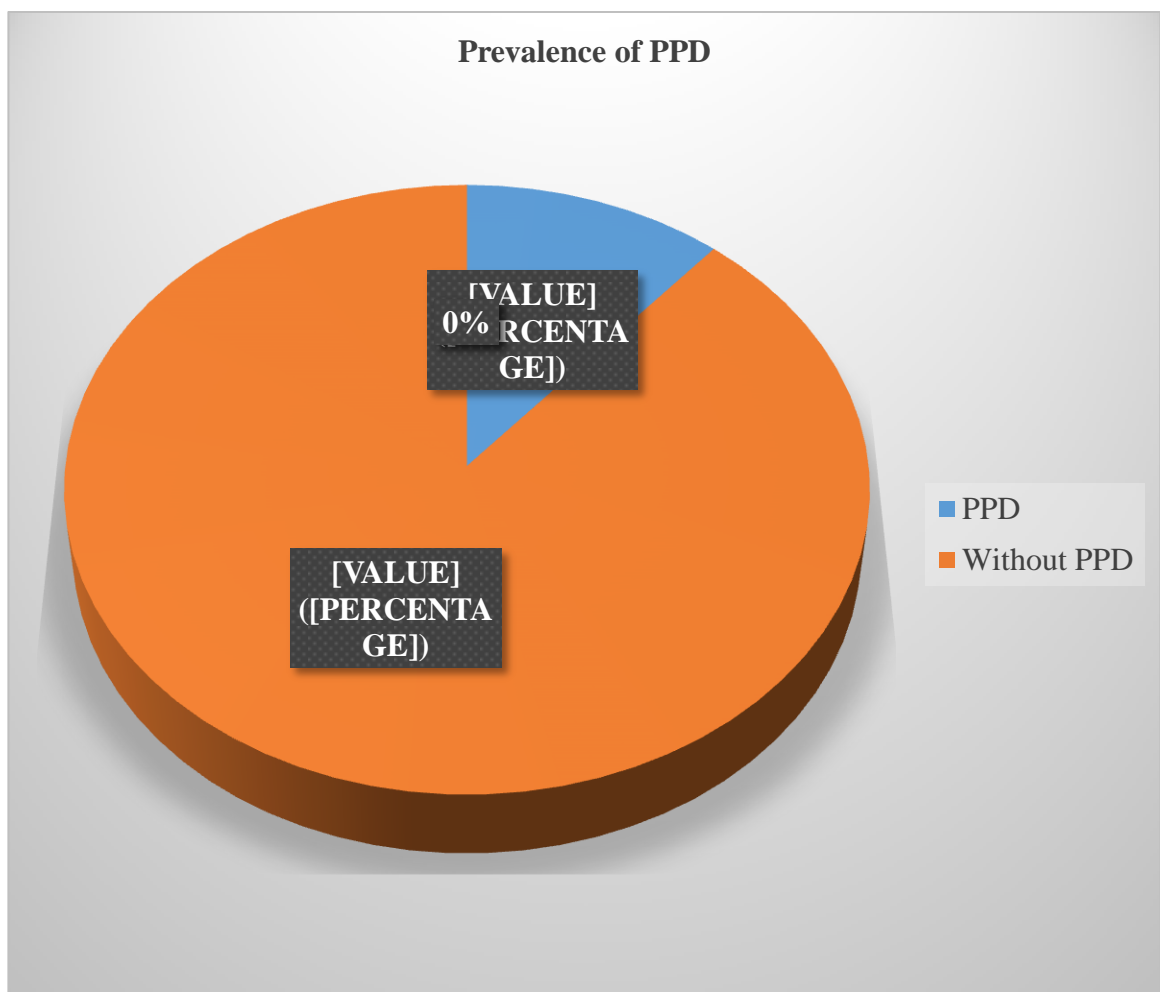
Figure 4.1: Prevalence of postpartum depression

Of the 381 study participants, 11% (43) of the mothers were screened positive of PPD, the screening was done by use of Edinburgh Postnatal Depression Screening tool (EPDS), (Figure 4.1).

4.4 Objective 3: Factors associated with postpartum depression

This study identified that there was no significant relationship between the sociodemographic, cultural and economic characteristics such as marital status of the mother, monthly income and PPD (Table 4.2).

Table 4.2 Relationship between Age, marital status, monthly income and Postpartum

depression

Variable	Postpartum Depression		Fisher Exact
	YES	**NO**	
Age of respondents			
10-19	4 (1.0)	25 (6.6)	1.31
20-29	23 (6.0)	203 (53.3)	
30-39	15 (3.9)	104 (27.3)	
40-49	1 (0.3)	6 (1.6)	
Marital status			
Single	10	62	
Married	30	270	4.99
Divorced	3	6	
Monthly income and PPD			
Ksh. 0-19000	30 (7.87)	227 (59.58)	
Ksh. 20000-39000	11 (2.89)	87 (22.83)	
Ksh. 40000-59000	2 (0.52)	5 (1.31)	5.14
Ksh. 60000	0 (0)	19 (5.0)	

This study also identified other factors that were not significant relationship between level of awareness, previous screening, mode of delivery, loss of pregnancy, baby sex and PPD. This study identified that there was a significant relationship between PPD and the following factors: Gender based violence, stress during the peri-partum period, lack of spousal support and unplanned pregnancy were also found to be significant with P values of P< 0.05, (Table 4.3).

Table 4.3 Relationship between PPD and possible associated factors

Factors	Postpartum Depression		Df	Chi-Square	P-value (Sig at 0.05)
	Yes	No			
Experienced Gender Based Violence					
Yes	20 (5.0)	48 (12.6)	1	23.5	0.00
No	24 (6.3)	289 (76.1)			
Stress level in mother					
Yes	29 (7.6)	117 (30.7)	1	17.3	0.00
No	14 (3.7)	221 (58.0)			
Awareness of PPD					
Yes	15 (3.9)	106 (27.8)	1	0.218	0.64
No	28 (7.3)	232 (6.9)			
Screening done for PPD					
Yes	2 (0.5%)	5 (1.3%)	1	2.12	0.145
No	41 (10.8%)	333 (87.4%)			
Spousal support					
Yes	24 (6.3%)	285 (74.8%)	1	21.0	0.00
No	19 (5.0%)	53 (13.9%)			
Planned pregnancy					
Intended	20 (5.2%)	241 (63.3%)	1	10.8	0.001
Not intended	23 (6.0%)	97 (25.5%)			
Mode of delivery			1	0.001	0.979

Spontaneous D	33 (8.7%)	260 (68.2%)			
Caesarean S	10 (2.6%)	78 (20.5%)			
Loss of Pregnancy					
No	31 (8.1%)	248 (65.1%)	1	0.32	0.858
Yes	12 (3.1%)	90 (23.6%)			
Baby sex					
Male	15 (3.9%)	102 (26.8%)	1	0.397	0.529
Female	28 (7.3%)	236 (61.9%)			

4.5 Diagnosis and treatment of PPD

Data on diagnosis of PPD was obtained through key informant guide designed for the health care providers (nurses) working in the perinatal clinic at the time of the study. The following was reported.

During the study period there was no information or records of mothers with PPD, however this research identified 43 mothers screened positive for PPD this is despite all nurses reporting to be aware of PPD.

At the time of the study, the mental health department records indicated no case of PPD have ever been reported, however, records indicates that 23 mothers have suffered from Post-partum psychosis in a period of September – December 2018.

4.5.1: Awareness of PPD screening tool among Health care workers
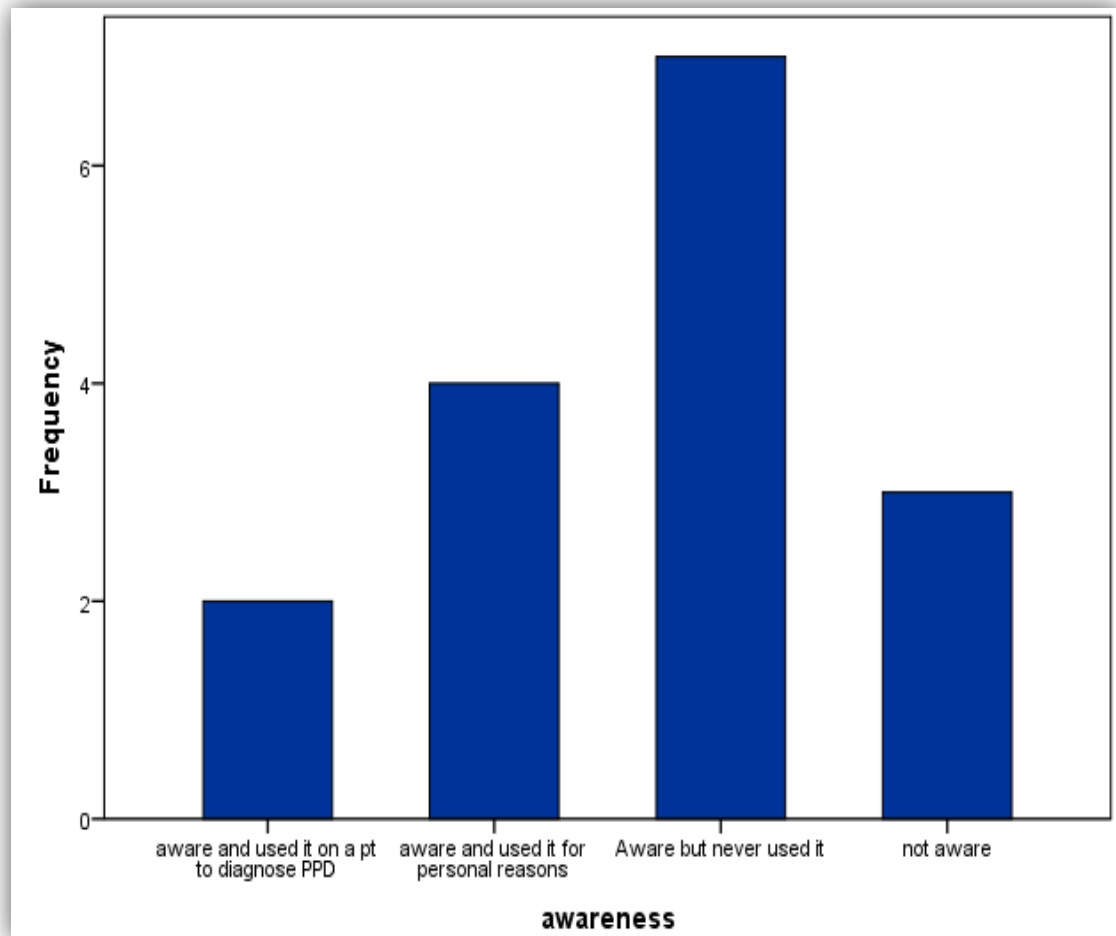
Figure 4.3 Awareness of postpartum screening tool among health care workers

Among the 16 health care workers working at the perinatal clinic, 5 nurses reported to have ever diagnosed PPD, whilst 11 nurses reported to have never diagnosed PPD. Majority of the health care workers 81.3% (13), reported to be aware of screening tools used to diagnose PPD whilst 18.3% (3) reported not to be aware of any screening tool. Among the 81.3%, only 37.5% (6) have ever used screening tool for either personal reasons or on a patient, whereas 43.8% (7) reported to have never used the screening tool.

4.5.2: Source of information regarding PPD screening tool
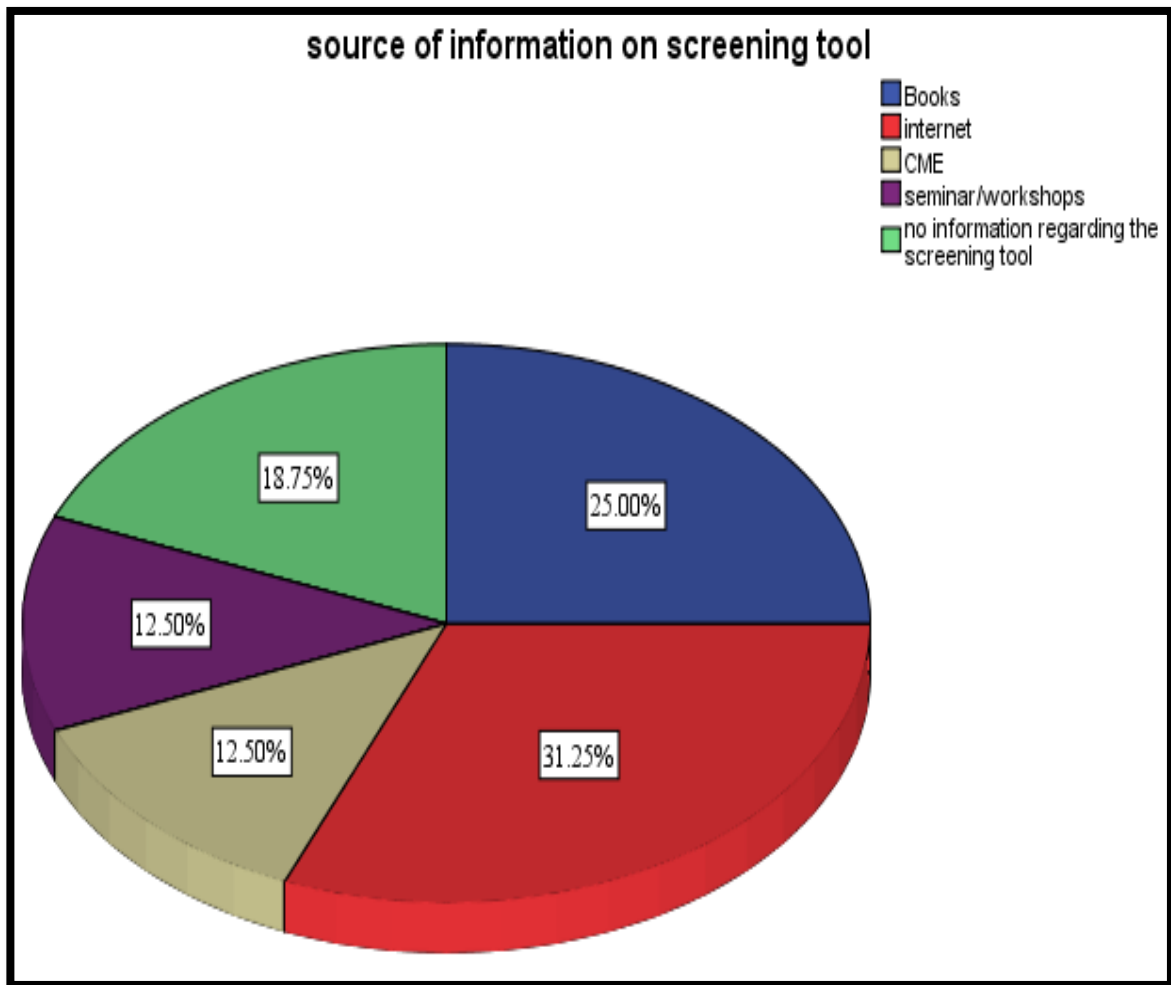
Figure 4.4: source of information regarding postpartum depression screening tool

Among the 16 health care workers interviewed, 31.25% reported to have found information regarding the screening tool on internet, whilst 12.5% reported to have been aware of the screening tool through seminar, workshops and CME's.

4.5.3 Barriers hindering early screening of PPD
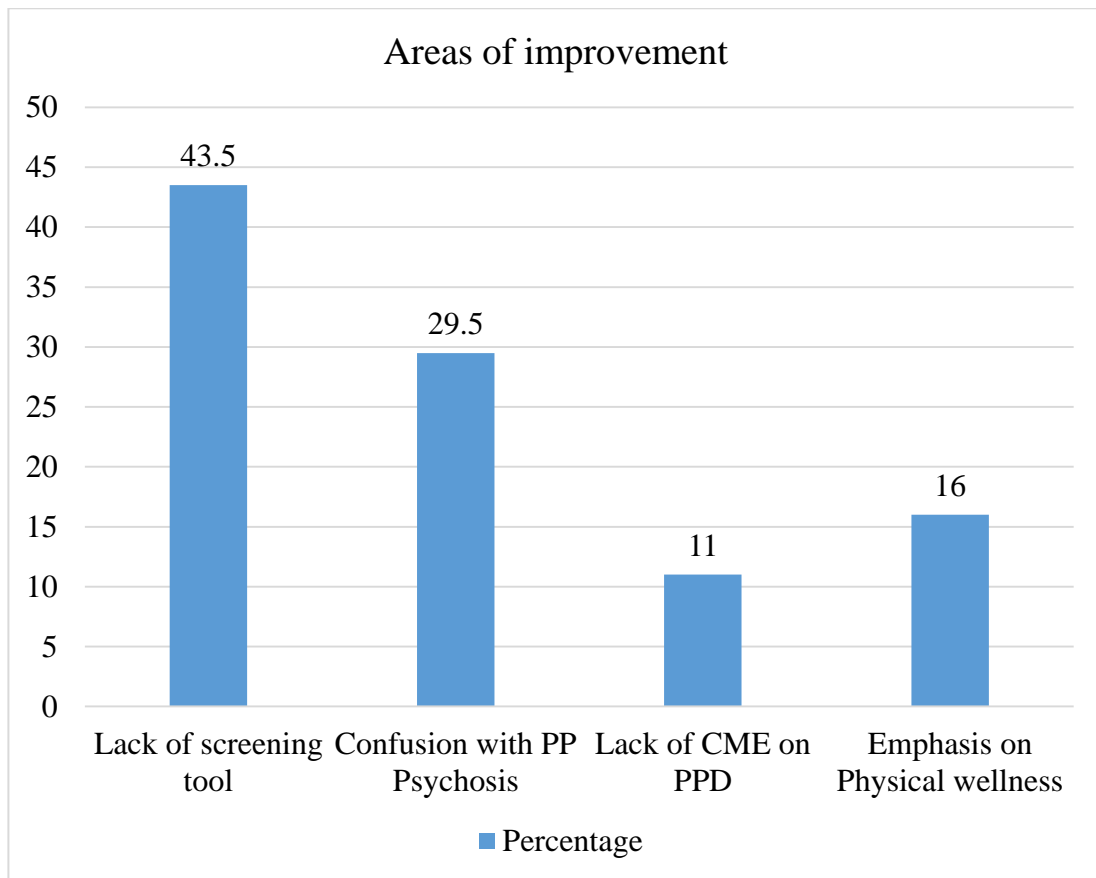
Figure 4.5: Observed barriers to early postpartum diagnosis

Among the health care workers interviewed, 43.5% noted lack of standard screening tool in the study area as the most important barrier to diagnosis of PPD whilst only 11% noted the lack of continuous medical education in the area.

4.5.4 Reported hindrance to early diagnosis of PPD
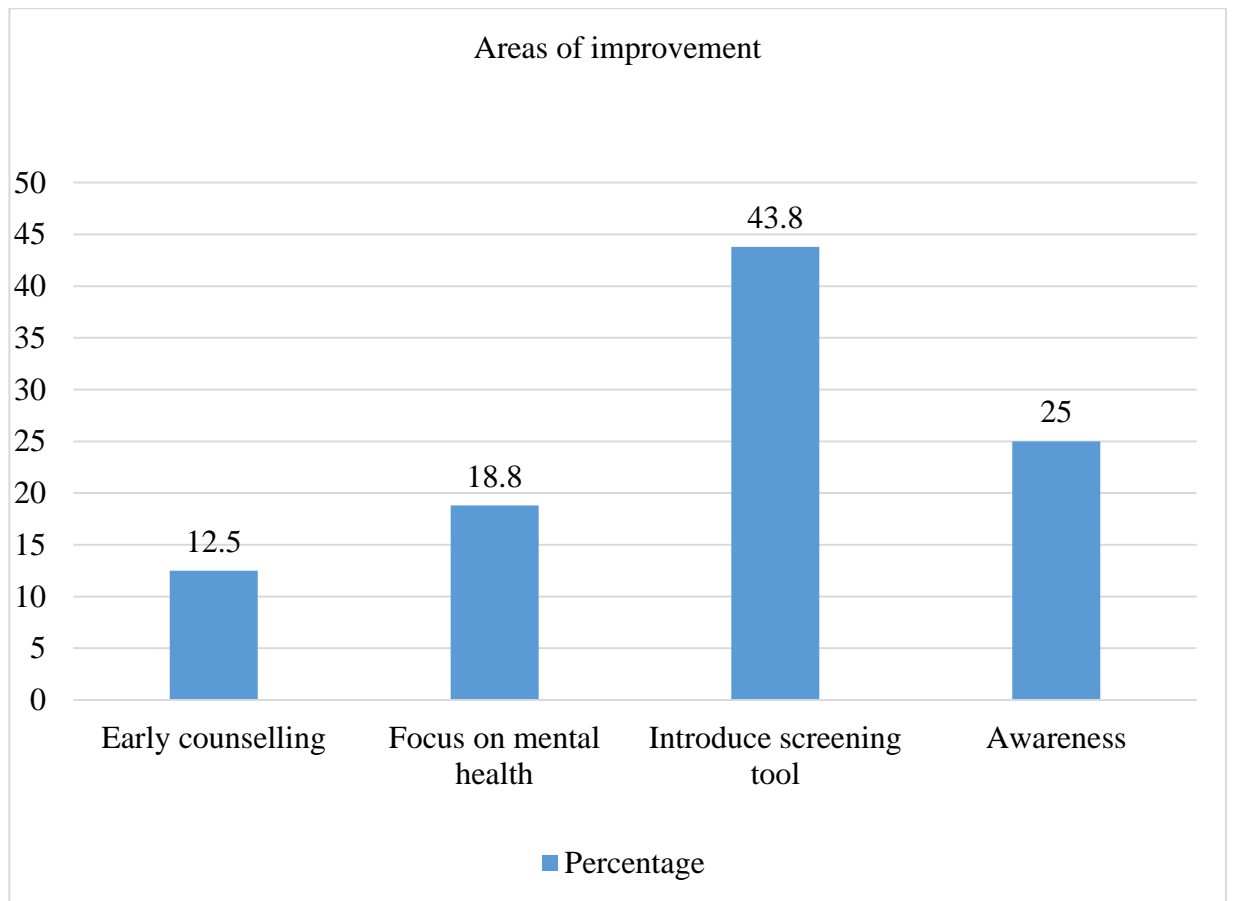
Figure 4.6: Areas for improvement for postpartum diagnosis

Majority of health the nurses interviewed (43.8%) suggested an introduction of standard screening tool in the study area as the most pressing area of improvement. Only 2 (12.5%) recommended early counselling of prenatal mothers.

CHAPTER FIVE: DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.1 DISCUSSION

5.1.1 Introduction

The lack of follow up and counselling postnatally has also lead to paucity of information on diagnosis and management of PPD.

In this section, a comprehensive interpretation and cross analysis of the results were discussed. Relevant comparisons and significant relationships were pointed out whilst considering the work of other researchers from different study areas in literature.

The chapters attempted to cover the broad and specific objectives of the study viz; Demographic characteristics, prevalence, barriers as well as factors associated with Post-partum depression among mothers attending clinical services at Nakuru Level 5 Hospital.

5.1.2 Socio-demographic characteristics of study participants

Most of the respondents reviewed (59.3%) were young mothers aged between 20-29 years with a median age of 24.5, this indicates the uptake of perinatal care clinics by young mothers and a well-received health education (Table 4.1). The apparent positive influence on education among young mothers was observed as the respondents aged 20-29 had secondary level of education and above. Additionally, majority (63.7%) of the educated mothers were reported to be aware of Post-partum depression (Table 4.1).

As discussed in literature, socio-economic status may be a factor contributing to postpartum depression. Being a Government hospital, it was reliable to make an assumption that patients attending Nakuru level 5 Hospital were mainly from a lower

socio-economic platform. This assumption was supported by the results that indicated that the majority (67.5%) of the respondents had a monthly oncome ranging between Ksh 0-19,000 whilst only 5% live on a monthly income above Ksh. 60,000 (Table 4.1).

5.1.3: Prevalence of postpartum depression in Nakuru Level 5 Hospital

The Edinburg Postpartum Depression Scale was used as a screening tool to screen the study participants of Postpartum Depression. The screening tool contained a 10-question self-report with four graduations that gives a total score of 30, which assesses the patient's mood, functional factors and emotional status for the last seven days. Mothers who scored 13 and above on the EDPS were screened as positive tests for PPD thus formed a basis of the prevalence of PPD.

The prevalence of PPD is estimated to be at 10 - 20% globally, (WHO, 2016), however, the prevalence rate in developing countries is estimated to be higher than that in developed countries, majorly due to the little emphasis placed on post-natal care and mental health issues. In Africa, the current literature places the average prevalence of PPD between 10% to 28% (Madeghe *et al.*, 2016). In the present study, 11.3% of the respondents were found to have postpartum depression. This was after they scored 13 points and above in Edinburgh Postpartum depression screening tool. These results concurs with the previous studies done in Kenyatta National hospital which reported a score of 10.6% and in Kariobangi, Nairobi at 13.5% (Madeghe *et al.*, 2016).

These variations in the prevalence of Postpartum depression may have been attributed several variables such as health status of the mother and child, economic well-being of the family and the support the mother gets from her spouse or the family in general. Cultural practices may also have a significant influence in the mental health of the

mother. For instance, some tribes insist on the mother and the new born keeping inside the house exclusively for three months postpartum without contact with outside world, this may lead to PPD (Madeghe *et al.*, 2016). The post-partum period which the study was done my also give varying results as screenings done 2 weeks post-delivery would give different results compared to screenings done 7 weeks postpartum (Madeghe *et al.*, 2016). For instance in the current study, PPD screening was done at 6 − 8 weeks postpartum whilst studies done in Nigeria (Tungchama *et al.*, 2018) and South Africa (Redinger *et al.*, 2018) was done between 3 to 12 months post-partum.

5.1.4 Factors associated with post-partum depression

This study identified a significant relationship between stress, gender-based violence, spousal support, planned pregnancy and PPD. Of the total subjects selected (N=381) 146 (62%) respondents reported that they were stressed during the peri-partum period whilst 38% were not stressed during the current pregnancy (Table 4.3). This showed a significant relationship between stress and PPD with a p-value of <0.05, this finding concurs with the research done by Agency for Health Care Research Quality (2012) who identified and classified stress as a strong predictor of PPD.

Seventeen point eight percent (17.8%) of mothers in this study experienced GBV. Gender based violence is another factor identified in this research as an associated factor of PPD (P<0.05). Gender based violence has been vastly documented as a factor associated with PPD. Some of the researchers' who identified violence as an associated factor of PPD include: Rahman *et al.,* (2013), whose research was on Interventions for Common Prenatal Mental Disorders In Women in Low- And Middle-Income Countries, they identified sufferers of gender based violence as a factor associated with PPD,

(Rahman *et al,* 2013). Moreover, a research done by Fisher (2012), identified Gender Based violence of both physical and emotional as a factor associated with PPD. Violence and dissatisfaction in marital relationships has been identified as factors associated with PPD (Addinshiwet and Yohannes 2018). In addition, Islam *et al.,* (2017) identified a significant relationship between PPD and women who were exposed to physical sexual or psychological violence while Adama and Adiema (2018), indicated a strong relationship between violence and negative health behaviors.

This research identified a strong relationship of women who lacked spousal support and PPD (P<0.05). This finding concurs with most researchers who identified a relationship between spousal support and PPD, Rahman *et al.,* (2013), identified lack of spousal support as a factor associated with PPD, Fisher (2012) also supported this. Strong family support presented in this study may have contributed to the statistically insignificant association between the level of income and PPD (P=1.37) in the current study. The income level did not significantly prove to contribute to postpartum depression however; majority of the respondents screened positive for PPD had a monthly income less than Ksh 19,000 (69.8%) (Table 4.1). This was not in tandem with previous literature, which reported a significant association between income levels and post-partum depression (Madeghe *et al.*, 2016; Parsons *et al.*, 2012). This finding is in contrast with the research done in Cameroon that indicated an association between the low-income level and PPD, (Adama *et al.,* 2016). In areas of low socio-economic income such as the present study area, the fathers are by default the breadwinners, even in the absence of a father; a child is regarded as part of a community according to tradition. In this regard the family and

community in general must provide all possible support to the mother and child pre and postpartum.

This research also identified an association between unintended pregnancy and PPD (P=0.001). This concurs with a study done by Rahman *et al*., (2013), who identified a relationship between PPD and unplanned pregnancy. This research identified no relationship between mode of delivery and PPD (P=0.979), this is consistent with the research done by Chinawa *et al.,* (2016) which noted no association between the mode of delivery and PPD. This finding concurs with the systematic review of four research studies done by Lucic (2013), which noted no association between postpartum depression and mode of delivery.

Despite majority of the study participants 67.4% (Table 4.1), had achieved secondary level of education and above, only 31.7% of the respondents were aware of PPD. This was apparently due to the confusion between PPD and postpartum psychosis. Some mothers specifically had not heard of PPD but were able to explain the symptoms consistent with post-partum psychosis which includes anxiety, irritability, delusions paranoia and loss of inhibitions immediately after birth (VanderKruik *et al.*, 2017). There was no statistically significant correlation between the lack of awareness of PPD among expectant mothers and PPD with a p value of 0.64, (Table 4.3). Of the total mothers interviewed, only 1.8% (7) were ever screened for PPD in their previous pregnancy and at a different hospital however, only 2 (0.5%) of the previously screened respondents were found to have postpartum depression (Table 4.3), this finding showed no association between lack of awareness, screening and PPD.

5.1.5 Treatment and diagnosis of postpartum depression

From this study, all the 16 nurses reported to be aware of PPD, and 37.5% had ever screened for it. Despite the various screening tools identified to screen postpartum depression, the researcher through the key informant guide tool realised that there was no screening tool present to screen mothers on PPD in the clinic at the time of the study. This concurs with research conducted by Ongeri et al., (2018), who identified the lack of screening tool in most health facilities in Kenya is a barrier to early diagnosis of PPD. This has therefore, led to decreased reported incidence on PPD, which is below the Kenya target set at 3%, (KHSSP, 2016). This may be attributed to little information available on mental health cases in Kenya, attributed to lack of proper diagnosis in outpatient clinics, (KDHS 2014), despite the availability of effective treatments and the measures created to detect depressive symptoms, (Philips, 2012). However, other experts recommends that screening programs should be availed only in circumstances where there is follow up interventions, (Ongeri *et al.,* 2018).

Moreover, all the health care workers interviewed reported the lack of screening tool in the perinatal clinic; however, 81.3% (Figure 4.2) reported to have been aware of a PPD screening tool. Among the health care workers who reported to be aware of PPD screening tool, 31.25% reported their source of information regarding the screening tool through internet whilst 12.5% reported to be aware of the screening tool through seminar/workshops and through continuous medical education (CME). It is important to empower health care workers in Kenya as various experts have recommended PPD screening during the first postpartum clinic, which is usually done within 2 – 6 weeks post-delivery at any health care interaction point, (Yawn *et al*., 2015).

Despite all health care workers reported to have been aware of PPD, the perinatal clinic did not have records for positively screened patients with PPD whereas, the study identified 43 mothers with PPD. This might be attributed to the lack of PPD screening tool in the study area during the study period, emphasis on the physical wellbeing of the mother, this finding concurs with Fitelson *et al.,* (2012) who attributed that mental disorders is not prioritised in developing countries due to competing health care disorders. Forty three point eight (43.8%) of the health care workers suggested an introduction of standard screening tool in the study area as the most pressing area of improvement whilst only 2 (12.5%) recommended early counselling of prenatal mothers (Figure 4.5). Caffrey (2018) concurs with this as he mentions that lack of awareness among health care workers and mothers and stigma stops women from seeking health care, thus leads to barrier to early diagnosis and treatment of PPD. The lack of early diagnosis of PPD, it leads to increased challenges in dealing with the disease and complications, (Mburu, 2013).

5.2 SUMMARY

This study sought to identify the prevalence of postpartum depression among mothers attending maternal-child health clinic services at Nakuru Level 5 Hospital, the factors associated with postpartum depression and diagnosis and treatment of PPD. A cross-sectional descriptive study design was used in this research and study participants were mothers who were 6-8 weeks postpartum seeking maternal child health clinic services at NL5H. Study participants were selected through simple random sampling from the accessible population until 381 study participants were identified. This study found out that the prevalence of PPD in NL5H was at 11.3%, which is comparable to studies done

in Kenya. The study also identified Gender Based Violence, stress, lack of spousal support and unplanned pregnancy as factors associated with PPD. This study identified that all the health care workers were aware of PPD screening tool through books, internet, continuous medical education and workshops although majority of them have never used the tool to screen patients. Lack of screening tool, confusion with postpartum psychosis, lack of CME and emphasis on physical wellness were identified as barriers to early diagnosis and treatment of PPD. Early counselling, focus on mental health, introduction of screening tool and raising awareness for both mothers and health care workers were identified as areas for improving diagnosis and treatment of PPD.

5.3 CONCLUSION

The study findings identified that there is no statistical relationship between sociodemographic, maternal and child factors and PPD, this study also identified the prevalence of PPD in Nakuru County at 11.3%, which is comparable to the findings obtained in Kenya, this study noted significant association between gender-based violence, stress, lack of spousal support, unplanned pregnancy and PPD. This study identified the following barriers to early diagnosis and treatment of PPD: Lack of screening tool in the study area, lack of holistic approach in examination of the mother as more emphasis was placed on the physical wellbeing of the mother other than the psychological and lack of health education on PPD.

5.4 RECOMMENDATION

5.4.1 Recommendations from the study

This study recommends the following based on the findings of this study: availability of a screening tool in maternal child health clinic and routine screening of mothers' in order to identify mothers suffering from PPD.

Integration of Maternal child health clinic (MCH), Gender based violence (GBV) and psychiatry department to offer support for victims suffering from PPD.

Sensitization of health care workers on PPD through continuous medical education, seminar and workshops. Community sensitization through mass media on postpartum depression.

5.4.2 Recommendations for further research

This study recommends interventional studies to look at how to minimize burden of PPD and how to improve the screening rates by health care workers.

REFERENCES

Abdollahi, F., Lye, M. S., & Zarghami, M. (2016). Perspective of Postpartum Depression Theories: A Narrative Literature Review. *North American journal of medical sciences*, *8*(6), 232–236. doi:10.4103/1947-2714.185027

Adama D., Fourmane P., Olen J., Dohbit S., Meka J., Mboudou E. (2015). Prevalence and Risk Factors of Postpartum depression in Yaounde, Cameroon. Open Journal of Obstertrics and Gynaecology. 5: 608 – 617. http://dx.doi.org/10.4236/ojog.2015.511086

Addishiwet F., Yohannes M., (2018). Domestic Violence as a Risk Factor for Postpartum Depression among Ethiopian Women: Facility Based Study: *Clinical Practice and Epidemiology in Mental Health* 14(1):109-119. DOI: 10.2174/1745017901814010109

Agency for Healthcare Research and Quality. (2012). Efficacy and Safety of Screening for Post-Partum Depression: Effective Health Care Program. Retrieved from www.effectivehealthcare.ahrq.gov

Behere, P. B., Das, A., Yadav, R., & Behere, A. P. (2013). Religion and mental health. *Indian journal of psychiatry*. *55*:2 (187–194). doi:10.4103/0019-5545.105526

Caffrey M., (2018). Obstetricians are Well-Positioned to Diagnose, Treat Postpartum Depression. American College of Obstetricians and Gynecologists (ACOG). The American Journal of Managed Care. April 2018. Retrieved from:

Chinawa J., Odetunde O., Kingsaley I., Chinonye E., Aniwanda E., Tamunusiki A., & Ezenyirioha U., (2016). Postpartum Depression among mothers as seen in hospitals in Enugu, South-East Nigeria. *Pan African Medical Journal*. 2016: 23:180. DOI. doi:10.11604/pamj.2016.23.180.8244

Cox J, Holden J, &Sagovsky R. (1987). Detection of Postnatal Depression: Development ofthe 10-Item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry*. Vol; 150:782–786.

Dennis C. & Dowswell T. (2013). Psychosocial and Psychological Interventions for Preventing Postpartum Depression. Cochrane Database Syst. Rev 2: CD001134.

Dennis C., Ravitz P., Grigoriadis S., Jovellanos M., Hodnett E., Ross L., Zupancic J., (2012). The effect of telephone-based interpersonal psychotherapy for the treatment of postpartum depression: study protocol for a randomized controlled trial. *BioMed Central* 13:38. Doi 10.1186/1745-6215-13-38

Fisher J, Cabral de Mello., Patel V., Rahman A., Tran T & Holton S. (2012) Prevalence and Determinants of Common Perinatal Mental Disorders in Women In Low- and-Middle-Income Countries: A Systematic Review. Bull World Health Organ. V90: 139G-49G http://dx.doi.org/10.2471/BLT.11.091850 PMID: 22423165.

Fitelson E., Kim S., Scott A., &Leight K., (2011).Treatment of Postpartum Depression: Clinical, Psychological and Pharmacological Options. *International Journal of Women's Health*. Vol; 3:1-14. Doi: 10.2147/IJWH.S6938

Haque A., Namavar A., & Breene K., (2015). Prevalence and Risk Factors of Postpartum Depression in Middle Eastern/ Arab Women. *Journal of Muslim Mental Health*. Vol: 9:1

Iranpour, S., Kheirabadi, G. R., Esmaillzadeh, A., Heidari-Beni, M., & Maracy, M. R. (2016). Association between sleep quality and postpartum depression. *Journal of research in medical sciences : the official journal of Isfahan University of Medical Sciences*, *21*, 110. doi:10.4103/1735-1995.193500

Islam J., Broidy L, Baird K, Mazerolle P (2017) Intimate partner violence around the time of pregnancy and postpartum depression: The experience of women of Bangladesh. 12(5): e0176211. https://doi.org/10.1371/journal.pone.0176211

Kenya Health Sector Strategic Plan 2014-2018, (2016). Statistical Review of Progress towards the Mid-term targets of the health sector strategic plan. Ministry of Health Republic of Kenya, (2016).

Ko J. Y., Farr, S. L., & Dietz, P. M. (2013). Barriers in the diagnosis and treatment of depression in women in the USA: *Neuropsychiatry*, *3*(1), 1–3. http://doi.org/10.2217/npy.12.76

Leddy MA, Farrow VA, Joseph GF, Jr, Schulkin J. (2012). Obstetrician, Gynecologists and postpartum mental health: differences between CME course takers and non-takers. J. *Continuing Education for health care professionals*. 32(1):39–47.

Lucic M. (2013). Incidence of Postpartum Depression after Cesarean Section versus Normal Delivery" (2013). *School of Physician Assistant Studies*. 441. https://commons.pacificu.edu/pa/441

Miyake Y., Tanaka K., Sasaki S. &Hirota Y. (2011). Employment, Income, and Education and Risk of Postpartum Depression: The Osaka Maternal and Child Health Study. *Journal of Affective Disorders*. Vol; 130:133-7.

Muraca G., & Joseph K., (2014). The association between maternal age and depression. Journal of Obstetrics and Gynaecology Canada. V 36(9):803-810. doi: 10.1016/S1701-2163(15)30482-5.

Mwikali V., (2013). Prevalence of Post-partum depression among women delivering at Kenyatta National hospital. Masters of Medicine in Obstetrics and Gynaecology. University of Nairobi. Viewed 23rd June 2018.

Nemade R, Reiss Staats N, Dombeck M. (2011). Psychology of Depression-Psychodynamic Theories. Available Online via: http://www.mentalhelp

O'Connor E., Rossom R., Henninger M., Groom H., Burda B., Henderson J., Bigler K. & Whitlock E., (2016) Screening for Depression in Adults: An Updated Systematic Evidence Review for the U.S. Preventive Service Task Force: Rockville: Agency for Healthcare Research and Quality.

Peltzer V., & Rodriguez V., Kyoung T., Jones D., (2018). Prevalence of prenatal and postpartum depression and associated factors among HIV- infected women in public primary care in rural South Africa: a longitudinal study, AIDS Care. 30:11 (1372 – 1379). doi 10.1080/09540121.2018.1455960

Pope, C. J., & Mazmanian, D. (2016). Breastfeeding and Postpartum Depression: An Overview and Methodological Recommendations for Future Research. *Depression research and treatment*, *2016*, 4765310. doi:10.1155/2016/4765310

Rahman A., Fisher J., Bower P., Luchters S., Tran T., Yasamy T., Saxena S. &Waheed W. (2013). Interventions for Common Perinatal Mental Disorders in Women in Low -and-Middle Income Countries: A Systematic Review and Meta-Analysis. Bulletin of the World Health Organization v91:593-601I. Doi: http://dx.doi.org/10.2471/BLT.12.109819

Rotich O. & Tugumisirize J., (2017). Mental Health in Developing Countries: Emphasis on Africa. Turku University of Applied Sciences, retrieved from https://www.theseus.fi/bitstream/handle/10024/133468/Omax%20Rotich%20%20and%20Job%20Tugumisirize%20%202017%20thesis%20final%202017.pdf?sequence=1

Saligheh M., Rooney R., Mc Namara B., & Kane R., (2014). The Relationship between Postnatal Depression, Socio-demographic Factors, Level of Partner Support and Levels of Physical Activity. *Front Psycho*. Vol 5:597. Doi 10.3389/fpsyg.2014.00597

Shidhaye P & Giri P. (2014): Mental Depression: A Hidden Burden in Developing Countries. Annals of Medical & Health Science Research. Vol (4):463-465 Doi: 10.4103/2141-9248.139268

Shivayogi, P. (2013). Vulnerable population and methods for their safeguard. *Perspectives in Clinical Research*, *4*(1), 53–57. http://doi.org/10.4103/2229-3485.106389

Sobey W., (2010). Barriers to Postpartum Depression Prevention and Treatment: A Policy Analysis. *Journal of Midwifery & Women's Health*. V (47)5:331-336. Doi: https://doi.org/10.1016/S1526-9523(02)00277-5

Stellenberg E., & Abrahams J., (2016). Prevalence of and Factors Influencing Postnatal Depression in a rural community in South Africa. South African journal of Psychology. 46 (4); 499. Doi: 10.1177/0081246316645045

The World Health Organization Report (2016): Prevalence and Determinants of Common Perinatal Mental Disorders in Women in Low- and Lower-Middle-Income Countries: A Systematic Review. Geneva: World Health Organization

The World Health Organization. Depression. 2012 Retrieved from. http://www.who.int/mental_health/management/depression/definition/en/index.html.

Upadhyay R., Chowdhury R., Salehi A., Sarkar K., Kumar S., Sinha B., Pawar A., Rajalashmi A., Kumar A., (2017). Postpartum depression in India: A systematic review and Meta-analysis. *World Health Organization*. Pubmed 29147043. DOI 10.2471/blt.17.192237

Yim, I. S., Tanner Stapleton, L. R., Guardino, C. M., Hahn-Holbrook, J., & Dunkel Schetter, C. (2015). Biological and psychosocial predictors of postpartum depression: systematic review and call for integration. *Annual review of clinical psychology*, *11*, 99–137. doi:10.1146/annurev-clinpsy-101414-020426

APPENDICES

Appendix 1: Edinburgh Postnatal Depression Screening Tool

INSTRUCTIONS FOR USERS

1. The mother checks off the response that comes closest to how she has felt during

    the past seven days.

2. All the 10 items must be completed

3. The mother should not discuss her answers with others

4. The mother should complete the scale herself or be aided by the researcher

5. The scale can be used at six weeks to eight weeks after birth or during pregnancy

Please TICK the answer that comes closest to how you have felt IN THE PAST

7 DAYS, not just how you feel today.

1. I have been able to laugh and see the funny side of things:

    ☐ As much as I always could _____ (0)

    ☐ Not quite so much now _____ (1)

    ☐ Definitely not so much now _____ (2)

    ☐ Not at all _____ (3)

2. I have looked forward with enjoyment to things:

    ☐ As much as I ever did _____ (0)

▢ Rather less than I used to ____ (1)

▢ Definitely less than I used to ____ (2)

▢ Hardly at all ____ (3)

3. I have blamed myself unnecessarily when things went wrong:

   ▢ Yes, most of the time ____ (3)

   ▢ Yes, some of the time ____ (2)

   ▢ Not very often ____ (1)

   ▢ No, never ____ (0)

4. I have been anxious or worried for no good reason:

   ▢ No, not at all ____ (0)

   ▢ Hardly ever ____ (1)

   ▢ Yes, sometimes ____ (2)

   ▢ Yes, very often ____ (3)

5. I have felt scared or panicky for no good reason:

   ▢ Yes, quite a lot ____ (3)

   ▢ Yes, sometimes ____ (2)

   ▢ No, not much ____ (1)

☐ No, not at all _____ (0)

6. Things have been getting to me:

    ☐ Yes, most of the time I haven't been able to cope at all _____ (3)

    ☐ Yes, sometimes I haven't been coping as well as usual _____ (2)

    ☐ No, most of the time I have coped quite well _____ (1)

    ☐ No, I have been coping as well as ever _____ (0)

7. I have been so unhappy that I have had difficulty sleeping:

    ☐ Yes, most of the time _____ (3)

    ☐ Yes, sometimes _____ (2)

    ☐ No, not very often _____ (1)

    ☐ No, not at all _____ (0)

8. I have felt sad or miserable:

    ☐ Yes, most of the time _____ (3)

    ☐ Yes, quite often _____ (2)

    ☐ Not very often _____ (1)

    ☐ No, not at all _____ (0)

9. I have been so unhappy that I have been crying:

    ☐ Yes, most of the time _____ (3)

    ☐ Yes, quite often _____ (2)

    ☐ Only occasionally _____ (1)

    ☐ No, never _____ (0)

10. The thought of harming myself has occurred to me:*

    ☐ Yes, quite often _____ (3)

    ☐ Sometimes _____ (2)

    ☐ Hardly ever _____ (1)

    ☐ Never _____ (0

Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786.

Appendix 4: Map of Nakuru County

Appendix 5: Informed Consent

Informed Consent

My name is Doris Jeptalam Tuitoek, I am a Masters student from Kenyatta University. I am conducting a study on the burden and determinants of postpartum depression among mothers attending Nakuru level five hospital. The information will be used by the Ministry of Medical Services and the Ministry of Public Health and sanitation to improve access and quality for screening of postpartum depression among mothers in hospitals as well as in other regions of Kenya.

Procedures to be followed

Participation in this study will require that I ask you some questions and I also examine you in order to screen you for postpartum depression and I will record the information obtained from you in the questionnaire.

You have the right to refuse participation in this study. You will get the same care and medical treatment whether you agree to join the study or not and your decision will not change the care you will be receive from the clinic today or that you will get from any other clinic at any other time.

Please remember the participation in the study is voluntarily. You may ask questions related to the study at any time.

You may refuse to respond to any questions and you may stop the interview at any time. You may also stop being in the study at any time without any consequences to the services you receive from this clinic or any other organization now and in the future.

<u>Discomforts and Risks</u>

Some of the questions will be asked are on intimate subject and may be embarrassing or make you uncomfortable. If this happens, you may refuse to answer these questions if you so choose. You may also stop the interview at any time. The interview may add approximately half an hour to the time you wait before you receive your routine services.

<u>Benefits</u>

If you participate in this study you will help us to learn how to provide effective screening services that can improve the health of women and reduce the risks associated with postpartum depression. You also benefit from being screened for postpartum depression and if you are found to have a problem you will be advised on the treatment.

<u>Confidentiality</u>

The interview and examinations will be conducted in a private setting within the clinic. Your name will not be recorded on the questionnaire. The questionnaires will be kept locked cabinet for safe keeping at Kenyatta University. Everything will be kept private.

<u>Contact Information</u>

If you have any questions you may contact Dr. Florence Oringe on 0722322363 or Dr. Kibiwott Koima on 0724793050 or the Kenyatta University Ethical Review Committee Secretariat on <u>chairman.kuerc@ku.ac.ke</u>, <u>ercku2008@gmail.com</u>

Participant's statement

The above information regarding my participation in the study is clear to me. I have been given a chance to ask questions and my questions have been answered to my satisfaction. My participation in this study is entirely voluntary. I understand that my records will be kept private and that I can leave the study at any time. I understand that I will still get the same care and medical treatment whether I decide to leave the study or not and my decision will not change the care that I will receive from the clinic today or that I will get from any other clinic at any other time.

Name of the Participant

……………………………………………………………………………………….

_____   _____

Signature or Thumbprint   Date

Investigators statement

I, the undersigned, have explained to the volunteer in the language s/he understands, the procedures to be followed in the study and risks and benefits involved

Name of Interviewer…………………………………………………………………

_____   _____

Signature or Thumbprint   Date

Appendix 6: Questionnaire

Questionnaire Number …………………………. Interview Date __ __/__ __/2017

Interviewer Code …………………………………….

A. Socio-Demographics

1. What is your age bracket?   (Tick where applicable)

    ☐ (10-19)   ☐ (20-29)   ☐ (30-39)

    ☐ (40 - 49)   ☐ (50 - 59)   other…………….

2. What is your Marital Status   (tick where Applicable)

    ☐ Single   ☐ Married   ☐ Divorced/Separated

    ☐ Widowed   ☐ Others (Specify) …………………..

3. What is your Religion

    ☐ Christian   ☐ Muslim   ☐ Hindu

    ☐ Pagan   Others (specify) ………………………

4. What is your ethnicity? ………………………………………………………………

5. Level of Education

    ☐ Never attended school   ☐ Secondary level   ☐ Primary level

    ☐ College level   others (specify)………………………

6. Place of Residence (where you are currently living)?
    i.   Urban ☐   ii. Rural ☐

B. Factors Associated with PPD

1. What is your Parity…………………………………………

2. What was the mode of delivery

   ☐ Spontaneous Vaginal Delivery   ☐ Caesarean section

3. In which type of housing do you live in?

   ☐ Permanent house   ☐ semi-permanent house ☐

   ☐ Temporary house   ☐ Others (specify) ……………………………

4. What is your occupation? ……………………………………………..………….

5. What is the total household income (Tick where applicable)

   ☐ Ksh. 0-19,000   ☐ Ksh. 20,000-39,000

   ☐ Ksh. 40,000-59000   ☐ Ksh. 60,000

6. Which type of family members do you live with?

   ☐ Nuclear Family   ☐ Extended Family

   ☐ Other…………………….

7. How many dependants do you have? …………………………………..

8. a. Do you suffer from any disability?

   i. Yes ☐   ii. No ☐

   b. If yes, specify……………………………………………..

9. Regarding this pregnancy:

   ☐ (a) I was actively trying to become pregnant;

   ☐ (b) I was not actively trying, but I was glad to become pregnant;

   ☐ (c) I wanted to be pregnant someday, but not now;

   ☐ (d) I did not want to be pregnant now or at any time in the future

10. a. Did you experience any stressful events during perinatal care

    i. Yes ☐   ii. No ☐

b. If yes, how did you cope with the stressful event?

☐ Crying   ☐Drinking Alcohol   ☐Praying

☐ Being with friends   ☐ Being with the family

☐ Others…………….

11. a. Did you suffer from any significant illness during the perinatal care?

☐Yes   ☐No

b. If yes, which type of illness did you suffer?

☐ Physical illness   ☐ Mental illness

☐ Others (specify)………………………………………….

c. Did you receive support from your spouse?

i. Yes ☐   ii. No ☐

d. Did you receive support from your family?

i. Yes ☐   ii. No ☐

12. During the perinatal period, did you experience any domestic violence?

i. Yes ☐   ii. No ☐

13. What level of decision-making authority do you have regarding your own health?

☐ I am the final decision maker

☐ My partner is the final decision maker regarding my health

☐ My immediate nuclear family are the final decision makers regarding my health

☐ My extended family members are the final decision makers on decisions regarding my health.

14. Since your baby was born, have you always had enough money to:

☐ Buy baby's clothing   ☐Buy baby's nappies

☐ Buy food   ☐Pay rent or mortgage

15. Tick where applicable

Key: 1 – Not satisfactory   2 – partially satisfactory   3 – Satisfactory

4 – Not aware

		1	2	3	4
1.	Level of spousal support regarding your health				
2.	Level of spousal support regarding the family				
3.	Level of family support regarding your health				
4.	Personal satisfaction with the newborn's sex outcome				
5.	Spousal satisfaction with the newborn's sex outcome				
6.	Family satisfaction with the newborn's sex outcome				
7.	Personal satisfaction with the newborn's health outcome				
8.	Personal level of satisfaction of the family involvement in your family activities				
9.	Personal satisfaction with the current occupation				
10.	Level of satisfaction with your coping skills				

C. Barriers To Early Diagnosis and Treatment of PPD

1. Are you aware of postpartum depression

☐ Yes   ☐ No

2. a. Have you ever been screened for postpartum depression?

☐ Yes   ☐ No

   b. If yes, when were you screened?
☐ Less than one month ago   ☐ Less than six months ago

☐ One year ago   ☐ More than one year ago

3. Which areas do we need to improve regarding mental health services during the

perinatal clinic…………………………………………………………………..........

……………………………………………………………………………………..........

....

....

D. SCREENING TOOL

INSTRUCTIONS

  i. Tick the first response that comes closest to how you felt during the past seven days.

  ii. Kindly complete all questions

 iii. Do not discuss your answers with others

ANSWER THE FOLLOWING QUESTIONS

   1. I have been able to laugh and see the funny side of things:

☐ As much as I always could

☐ Not quite so much now Definitely not so much now

☐ Not at all

2. I have looked forward with enjoyment to things:

    ☐ As much as I ever did _____

    ☐ Rather less than I used to _____

    ☐ Definitely less than I used to _____

    ☐ Hardly at all _____

3. I have blamed myself unnecessarily when things went wrong:

    ☐ Yes, most of the time _____

    ☐ Yes, some of the time _____

    ☐ Not very often _____

    ☐ No, never _____

4. I have been anxious or worried for no good reason:

    ☐ No, not at all

    ☐ Hardly ever

    ☐ Yes, sometimes

    ☐ Yes, very often

5. I have felt scared or panicky for no good reason:

    ☐ Yes, quite a lot

    ☐ Yes, sometimes

    ☐ No, not much

    ☐ No, not at all

6. Things have been getting to me:

    ☐ Yes, most of the time I haven't been able to cope at all

    ☐ Yes, sometimes I haven't been coping as well as usual

    ☐ No, most of the time I have coped quite well

    ☐ No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping:

      ☐ Yes, most of the time _____

      ☐ Yes, sometimes _____

      ☐ No, not very often _____

      ☐ No, not at all _____

8. I have felt sad or miserable:

      ☐ Yes, most of the time _____

      ☐ Yes, quite often _____

      ☐ Not very often ___

      ☐ No, not at all _____

9. I have been so unhappy that I have been crying:

      ☐ Yes, most of the time _____

      ☐ Yes, quite often _____

      ☐ Only occasionally _____

      ☐ No, never _____

   10. The thought of harming myself has occurred to me:

      ☐ Yes, quite often _____

      ☐ Sometimes _____

      ☐ Hardly ever _____

      ☐ Never _____

Appendix 7: Health Care Provider Key Informant Guide

Burdens and determinants of postpartum depression among mothers attending Nakuru Level Five Hospital.

Respondent's No. -------------------------   Date --------------------

1. What is your age………………………………
2. What is your gender? ☐ Male   ☐ Female
3. What is your profession?

    ☐ Nursing officer   ☐Clinical officer   ☐Medical officer

    ☐Consultant   ☐Other specify …………………………………

4. How many years of experience have you practiced in a clinical setting? …………..

5. How long have you worked in outpatient perinatal care? ....

6. Are you aware of postpartum depression?

    ☐Yes   ☐ No

7. a. Does the hospital have a screening tool for screening postpartum depression?

    ☐Yes   ☐No

  b. If yes, are you familiar with the screening tool?

    ☐ Yes   ☐No

  c. Does the hospital have a referral system for mothers suffering from postpartum depression?

    ☐Yes   ☐No

  d. Does the hospital have a record of the positively screened mothers?

    ☐Yes   ☐No

8. Have you ever diagnosed postpartum depression?

    ☐Yes   ☐ No

9. What are the area that needs to be improved during the perinatal care that would aid in early diagnosis and treatment of postpartum depression?
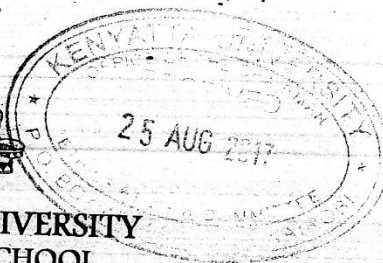
    ………………...

    ………...

Appendix 8: Graduate School Approval

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 020-8704150

Our Ref: Q57/NKU/PT/27262/14

DATE: 26th July, 2017

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR MS. DORIS JEPTALAM TUITOEK –
**REG. NO. Q57/NKU/PT/27262/14**

I write to introduce Ms. Doris Jeptalam Tuitoek who is a Postgraduate Student of
this University. She is registered for M.P.H. degree programme in the Department
of Community Health.

Ms. Tuitoek intends to conduct research for a M.P.H. thesis Proposal entitled,
"Burden and Determinants of Post-Partum Depression among Mothers Attending
Nakuru Level 5 Hospital in Nakuru County, Kenya."

Any assistance given will be highly appreciated.

Yours faithfully,

MRS. LUCY N. MBAABU
FOR: DEAN, GRADUATE SCHOOL
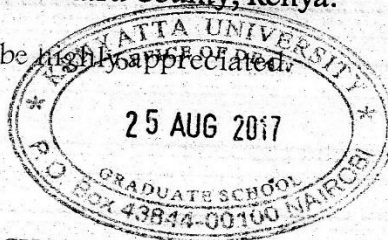
Appendix 9: Kenyatta University Ethics Review Committee Approval (KUERC)

KENYATTA UNIVERSITY
ETHICS REVIEW COMMITTEE

Fax: 8711242/8711575
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    kuerc.secretary@ku.ac.ke
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Nairobi, 00100

Tel: 8710901/12

Our Ref: **KU/ERC/APPROVAL/VOL.1** (96)

Date: 18ᵗʰ October, 2017

Doris Jeptalam Tuitoek
Kenyatta University
P.O. Box 43844-0100
NAIROBI.

Dear Doris,

APPLICATION NUMBER PKU/729/I799 **"Burden and Determinants of Post-partum Depression among mothers attending Nakuru level 5 Hospital in Nakuru County, Kenya."**

1. IDENTIFICATION OF PROTOCOL

The application before the committee is with a research topic Application Number: **PKU/728/I797** **"Burden and Determinants of Post-partum Depression among mothers attending Nakuru level 5 Hospital in Nakuru County, Kenya."** received on 25ᵗʰAugust, 2017 and Approved on 12ᵗʰ September 2017.

2. APPLICANT

Doris Jeptalam Tuitoek

3. SITE

Nakuru, Nakuru County, Kenya

4. DECISION

The committee has considered the research protocol in accordance with the Kenyatta University Research Policy (Section 7.2.1.3) and the Kenyatta University Review Committee Guidelines

**AND APPROVED** that the research may proceed for a period of **ONE** year from 18th October 2017.

ADVICE/CONDITIONS

i.   Progress reports are submitted to the KU-ERC every six months and a full report is submitted at the end of the study.

ii.   Serious and unexpected adverse events related to the conduct of the study are reported to this committee immediately they occur.

iii.   Notify the Kenyatta University Ethics Committee of any amendments to the protocol.

iv.   Submit an electronic copy of the protocol to KUERC.

When replying, kindly quote the application number above.

If you accept the decision reached and advice and conditions given please sign in the space Provided below and return to KUERC a copy of the letter.
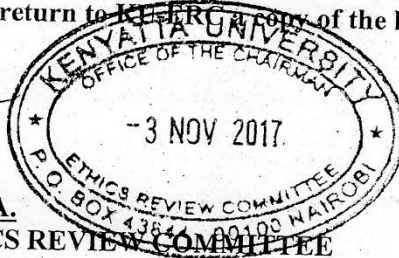
DR. TITUS KAHIGA.
CHAIRMAN ETHICS REVIEW COMMITTEE

I ...DORIS... J... TUITOEK...... accept the advice given and will fulfill the conditions therein.

Signature.................... Dated this day of... 3rd... November...........2017.

C.c. DVC Research Innovation and Outreach

Appendix 10: National Commission for Science, Technology and Innovation Research Permit

MINISTRY OF EDUCATION
State Department of Basic Education

Telegrams: "EDUCATION",
Telephone: 051-2216917
Fax: 051-2217308
Email: cdenakurucounty@yahoo.com
When replying please quote
Ref. NO.
CDE/NKU/GEN/4/1/21 VOL.VI/50

COUNTY DIRECTOR OF EDUCATION
NAKURU COUNTY
P. O. BOX 259,
NAKURU.

11TH DECEMBER, 2017

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION:
       DORIS JEPTALAM TUITOEK
       NACOSTI PERMIT NO/P/17/91791/20141

Reference is made to letter ref. NACOSTI permit No. P/17/91791/20141 dated 22nd November, 2017.

Authority is hereby given to the above named to carry out research on *Burden and determinants of post-partum depression among mothers attending Nakuru Level 5 Hospital in Nakuru County, Kenya"* for a period ending 20th November, 2018.

Kindly accord her the necessary assistance.

GEORGE M. ONTIRI
FOR: COUNTY DIRECTOR OF EDUCATION
NAKURU COUNTY

Copy to:

Kenyatta University
P.O. Box 43844-00100
NAIROBI.

Appendix 11: Approval by Nakuru Level 5 Hospital Superintendent

MINISTRY OF HEALTH

Telegrams: "PROVMED", NAKURU
Telephone: Nakuru 051-2215580-90
When replying please quote
FAX 051 2216497
Email:rvpghnakuru@yahoo.com

PROVINCIAL GENERAL HOSPITA
RIFT VALLEY PROVINCE
P.O. Box 71
NAKURU.

RII/VOL I/08

Date......**19**TH **DECEMBER 2017**.......................................

To ......**DORIS JEPTALAM TUITOEK**..........

....

....

Dear ....**SIR**...

RE: APPROVAL TO UNDERTAKE RESEARCH AT THE
RIFT VALLEY PROVINCIAL GENERAL HOSPITAL

Reference is made to your letter dated ......**11**TH **DECEMBER 2017**..........seeking
approval to conduct a research on **"BURDEN AND DETERMINANTS OF POST –**
PARTUM DEPRESSION AMONG MOTHERS ATTENDING NAKURU LEVEL 5
HOSPITAL IN NAKURU COUNTY"...................

Permission has been granted/not granted for the research. It is hoped that you will
adhere to the ethics and standards that relate to research at our institution.
Thank you.

Yours Sincerely,

MEDICAL SUPERINTENDENT

CHAIRPERSON
RESEARCH AND ETHICS COMMITTEE

DECLARATION

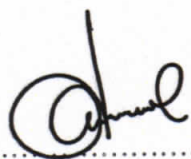"This thesis is my original work and has not been presented for a degree in any other university."

Signature.. Date 9|11|2019

Doris Jeptalam Tuitoek -Q58/NKU/PT/27262/2014
Department of Community Health

SUPERVISORS

We confirm that the work reported in this thesis was carried out by the candidate under our supervision

Signature.. Date 0th Nov.2019

Dr. Florence Okwara
Department of Paediatrics and Child Care
Kenyatta University

Signature.. Date 12/11/2019

Dr. Kibiwott Koima
Department of Computer Science and Applied statistics
Kabarak University